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Examining the Psychometrics of the Psychopathology Inventory for Mentally Retarded Adults-II for Adults with Mild and Moderate Intellectual Disabilities

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EXAMINING THE PSYCHOMETRICS OF THE PSYCHOPATHOLOGY INVENTORY FOR MENTALLY RETARDED ADULTS-II FOR ADULTS WITH MILD AND MODERATE INTELLECTUAL DISABILITIES

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Abstract

With growing recognition of the occurrence of psychological disorders in individuals with intellectual disability (ID), researchers and clinicians alike have placed emphasis on developing measures to assess for psychopathologies in this population. Despite an increased interest in the topic, there is still a dearth of psychometrically robust measures available to assess for psychopathology in adults with mild and moderate ID. The purpose of this study was to examine the psychometric properties of a revised measure for psychopathology in individuals with mild and moderate ID, the Psychopathology Inventory for Mentally Retarded Adults – Second Edition (PIMRA-II). Internal consistency, inter-rater reliability, and test-retest reliability was investigated. Validity was studied via convergent validity by comparing the PIMRA-II to the Assessment of Dual Diagnosis (ADD) and via discriminate validity by comparing the PIMRA-II to the Social Performance Survey Schedule (SPSS) prosocial scores. Lastly, an exploratory factor analysis was conducted to determine the factor structure of the scale.

Examining the Psychometrics of the Psychopathology Inventory for Mentally Retarded Adults-II for Adults with Mild and Moderate Intellectual Disabilities

Intellectual disability (ID) is a condition which includes a variety of clinical presentations, syndromes, and underlying pathologies and is known to affect roughly 1-3% of individuals worldwide (Bakken et al., 2010; Brereton, Tonge, & Einfeld, 2006; De Ruiter, Dekker, Verhulst, & Koot, 2007; Harris, 2006; Leonard & Wen, 2002; Matson, Belva, Hattier, & Matson, 2012). Though there are many known genetic conditions that lead to ID, social and cultural factors also play a role in the development of ID (Chen, Tseng, Hu, & Koh, 2010; Matson, Kiely, & Bamburg, 1997). Psychological disorders as well as deficits in adaptive and self-help skills commonly co-occur in individuals with ID (Lante, Reece, & Walkley, 2010; Liu et al., 2010; Sun, Zhu, Shih, Lin, & Wu, 2010; Wu, Qiu, Wong, Hernandez, & Zhao, 2010). Among those with ID, problems such as epilepsy and challenging behaviors (e.g., physical aggression, self-injurious behavior, and pica) also occur at an elevated rates (Allen, 2008; Bhaumik, Tyrer, McGrother, & Ganghadaran, 2008; Duncan, Matson, Bamburg, Cherry, & Buckley, 1999; Emerson et al., 2001; Fitzgerald & Ring, 2009; Lambrechts, Van Den Noortgate, Eeman, & Maes, 2010; Rojahn, Rowe, Kaplan, Moore, & van Ingen, 2011; Rose, 2010; Smith & Matson, 2010a).

Introduction to Intellectual Disabilities

ID, formerly known as mental retardation (Schalock et al., 2007), can be defined as (1) a significantly sub average intelligence quotient (IQ), (2) deficits in adaptive behavior, and (3) an onset before the age of 18 (Oltmanns & Emery, 2012). Sub-average intellectual functioning can be determined in terms of a score on an individualized intelligence test, which is considered a standardized measure for assessing intellectual ability. Commonly used intelligence tests include the Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV) and the Stanford-Binet

Intelligence Scales (SB-5). Intelligence tests yield an IQ score; the test's rating of an individual's intellectual ability. However, the IQ score should not be considered an absolute score and should be considered in context with the confidence interval. Commonly held criteria for ID indicate that an IQ score between 50-55 to 70 signifies mild ID, between 35-40 to 50-55 indicates moderate ID, between 20-25 to 35-40 suggests severe ID, and lower than 20-25 aligns with profound ID. The ranges for these IQ scores are included to take into account confidence intervals as well as an individual's adaptive behavior skills when considering the category of ID diagnosis.

Psychologists have emphasized that intelligence is more than an IQ score; thus, they have included adaptive behavior as part of their definitions of ID (Oltmanns & Emery, 2012). Adaptive behavior is defined as the capacity to satisfy developmental and social demands of one's immediate environment (Grossman, 1983). Examples of adaptive skills include conceptual skills (e.g., communication, functional academics, self-direction, and health and safety), social skills (e.g., understanding how to conduct oneself in social situations), and practical skills (e.g., daily living skills, self-care, home living, community use, work skills). Many measures have been created to assess for adaptive behavior such as the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 2005). While the combination of IQ and adaptive skills is commonly used to assess for ID, the creators of the DSM 5 have pushed for a greater emphasis on adaptive behavior when diagnosing those with ID.

Diagnosis of ID is delineated into four categories: mild, moderate, severe, and profound. Individuals with mild ID make up the largest segment of those with ID, approximately 85%. These individuals typically acquire social and communication skills during the preschool years and regularly are not distinguishable from children without ID until a later age (Vandernagel et

al., 2014). By their late teens, they can acquire academic skills up to approximately the sixth grade level. During their adult years, these individuals usually achieve social and vocational skills adequate for minimum self-support, but may need supervision, guidance, and assistance, especially when under stress (Holwerda, van der Klink, de Boer, Groothoff, & Brouwer, 2013). With appropriate supports, individuals with mild ID can live successfully in the community, either independently or in supervised settings such as group homes.

Individuals with moderate ID make up approximately 10% of those with ID. Most of the individuals with this level of ID acquire communication skills during early childhood years (Hardiman, Guerin, & Fitzsimons, 2009). They profit from vocational training and, with some supervision, can attend to their personal care (e.g., hygiene and clothing themselves). These individuals can benefit from training in social and occupational skills but are unlikely to progress beyond the second grade level in academic skills (Alberto, Waugh, & Fredrick, 2010). During adolescence, their difficulties in recognizing social rules may interfere with their ability to establish friendships and romantic relationships. In their adult years, the majority are able to perform unskilled or semiskilled work under supervision. They adapt well to life in the community, usually in supervised settings (Enkelaar, Smulders, Lantman-de Valk, Weerdesteyn, & Geurts, 2013).

Those with severe ID constitute approximately 3-4% of those overall with ID. These individuals acquire little to no communicative speech during the early childhood years. During the school-age period, these individuals may learn to talk and can be trained in basic self-care skills. Individuals with severe ID may benefit only limitedly from instruction in pre-academic subjects, such as familiarity with the alphabet and simple counting, and may master skills such as learning sight reading of some simple words (Medeiros, Curby, Bernstein, Rojahn, & Schroeder,

2013). In their adult years, these individuals may be able to perform simple activities in close supervised settings. Most individuals with severe ID adapt well to life in group homes or with their families (Vos et al., 2013).

Individuals with profound ID make up the smallest group of those with ID, approximately 1-2%. Most individuals with this diagnosis have an identified neurological condition that accounts for their ID (van Vonderen, de Swart, & Didden, 2010). These individuals exhibit considerable difficulties in sensorimotor functioning during the early childhood years (Lambrechts & Maes, 2008). Highly structured environments with constant aid and supervision and an individualized relationship with a caregiver will likely yield the most optimal development in these individuals.

Psychopathology in Individuals with Intellectual Disabilities

Prior to the 1970s, researchers believed that individuals with ID were not capable of experiencing emotional and psychological disorders due to insufficient ego strength to have these problems (Deb, Thomas, & Bright, 2001). However, this view has fallen by the wayside over the past three decades as researchers have shown that individuals with ID can not only experience psychological disorders, but have an increased risk for them as compared to the general population (Borthwick-Duffy, 1990; Cooper, Smiley, Morrison, Williamson, & Allan, 2007; Deb et al., 2001; Fuller & Sabatino, 1998; Matson & Bamburg, 1999; Reiss, 1990; Rojahn & Tasse, 1996; Rush, Bowman, Eidman, Toole, & Mortenson, 2004; Smiley, 2005). The estimated prevalence of comorbid psychological disorders in persons with ID varies widely depending on the study (Borthwick-Duffy, 1994; Cooper et al., 2007; Deb et al., 2001; Turner, 1989). Researchers have reported prevalence estimates ranging from 10-71% depending on the diagnostic criteria used and population investigated (Borthwick-Duffy & Eyman, 1990; Bouras & Drummond, 1992; Corbett, 1979; Holland & Koot, 1998; Raghavan, 2004). The sites at which these studies were conducted may have influenced the large difference in prevalence estimates. Prevalence rates in hospital and other inpatient populations (Hurst, Nadarajah, Cumella, 1994; Taggart, 2003; Trower, Treadwell, & Bhaumik, 1998) are likely higher than in community or attending day centers (Cooper & Bailey, 2001; Deb et al., 2001).

Due to the common occurrence of psychological disorders in individuals with ID, it has become a heavily studied topic (Matson, Belva et al., 2012). Numerous researchers have provided evidence that individuals with ID are more likely to evince co-morbid psychopathology than individuals in the general population (Cherry, Penn, Matson, & Bamburg, 2000; Dekker, Koot, van der Ende, & Verhulst, 2002; Matson & Smiroldo, 1997; Paclawskyj, Matson,

Bamburg, & Baglio, 1997). In those with ID, commonly seen psychiatric disorders include Major Depressive Disorder (MDD), attention-deficit/hyperactivity disorders (ADHD), anxiety disorders, psychotic disorders, and autism spectrum disorders (ASDs) among others (Deb et al., 2001, Deb & Prasad, 1994; Dekker & Koot, 2003; Hastings, Beck, Daley, & Hill, 2005; McGrother, Hauck, Bhaumik, Thorp, & Taub, 1996). In one study, Deb and colleagues (2001) observed that schizophrenia and phobias were the most common psychiatric disorders among adults with ID. Children with ID are also more likely to evince ADHD or ASD than typically developing children (Koskentausta, Iivanainen, & Almqvist, 2002). Additionally, increased age and the presence of physical disability have been found to be significantly associated with higher rates of psychiatric comorbidity among individuals with ID (Deb et al., 2001).

The majority of research up to this point has focused primarily on only one comorbid diagnosis (e.g., ASD and ID); however, there is less research on the presence of ID and two or more Axis I disorders (Kozlowski, Matson, Sipes, Hattier, & Bamburg, 2011). Previously, researchers have investigated the comorbidity of multiple Axis I disorders in typically cognitive functioning (non-ID) individuals, for example, the interaction between mood and anxiety disorders (Erwin, Heimberg, Juster, & Mindlin, 2002; Olatunji, Cisler, & Tolin, 2010). Researchers have also noted that the presence of one disorder or class of symptoms puts an individual at a higher risk for other disorders or symptoms (e.g., mood disorders and conduct disorders [Kovacs, Paulauskas, Gatsonis, & Richards, 1988] and substance use disorders and anxiety disorders [Grant et al., 2004]).

Kozlowski and colleagues (2011) investigated correlates in symptom clusters in individuals with ID and comorbidity using the Diagnostic Assessment for the Severely Handicapped (DASH-II; Matson, Gardner, Coe, & Sovner, 1991). The authors found that

elevations on the Impulse subscale were most common in the sample, with comorbid elevations commonly occurring in the Mood, Mania, and Anxiety subscales (Kozlowski et al., 2011). Additionally, several significant correlations were found between the Organic and Mood, Mood and Mania, and ASD/Autism and Stereotypies subscales. In sum, while there is limited research investigating multiple psychological disorders in persons with ID, the results of several recent studies point to occurrence and importance of assessing for multiple psychological disorders in this population.

The following sections will review past literature on the presence of certain types of psychopathology (i.e., schizophrenia, MDD, conduct problems, psychosexual disorders, anxiety disorders, mania, and ASD) in individuals with ID. These psychopathology topics were selected due to the fact that they are the categories present on the PIMRA-II, the focus of this study.

Schizophrenia and Intellectual Disabilities

Schizophrenia is a mental illness that affects approximately 1% of the population and results in serious and lifelong impairments (Lai, Hung, Lin, Chien, & Lin, 2011; Morgan, Leonard, Bourke, & Jablensky, 2008). Similar to psychopathology in general, researchers have found that rates of schizophrenia are higher in individuals with ID compared to typically developing populations (Deb et al., 2001). One hypothesis to this phenomenon is the notion that lowered IQs may lead the individual to make incorrect assumptions about their social environment (Bouras et al., 2004). Other researchers have suggested that the co-occurrence of the two conditions could be related to a particularly strong familial relationship between ID and schizophrenia (Greenwood, Husted, Bomba, Hodgkinson, & Bassett, 2004). Numerous researchers have found different prevalence rates of schizophrenia and ID (Hemmings, 2006; Lai et al., 2011) such as 15.55% in the United States (Crews, Bonaventura, & Rowe, 1994), 17.4% in

Norway (Bakken et al., 2010), and 8% in Sweden (Nettelbladt, Göth, Borgren, & Mattisson, 2009). Researchers in Australia found that 31.7% of people with ID had a psychotic disorder and 3.7%-5.2% of those with ID exhibited co-occurring schizophrenia (Morgan et al., 2008). Lastly, Italian researchers found a prevalence of 1.3-3.7% for schizophrenia in individuals with ID (La Malfa, Lassi, Bertelli, Venturi, & Placidi, 2004). Despite the widely ranging estimates, it is evident that schizophrenia is reported at a higher rate in persons with ID than in the general population.

With high comorbidity rates of ID and schizophrenia, researchers have also found that these individuals require extensive medical care (Lai et al., 2011). Specifically, when comparing ID in individuals with and without comorbid schizophrenia, individuals with comorbid ID and schizophrenia consumed over double the annual inpatient fees in a Taiwan sample than those without schizophrenia (Lai et al., 2011). In addition to increased expenses in medical care, previous researchers have also found that it is difficult to determine accurate schizophrenia diagnoses in ID populations. Morgan and colleagues (2008) investigated two groups of individuals with ID, those with a dual diagnosis of schizophrenia and those without a schizophrenia diagnosis. The authors found that those with a dual diagnosis of schizophrenia were likely first given a diagnosis of paranoid psychoses, personality disorders, psychotic and non-psychotic organic disorders, acute reaction to stress or adjustment reaction, specific delays in development, disturbance of conduct, neurotic disorders, and/or depressive disorders (Morgan et al., 2008).

Morgan and colleagues (2008) also found that those in the dual diagnosis group (i.e., ID and schizophrenia) were more likely to attempt suicide or serious self-harm than those in the ID only group. In addition to increase risk for suicide or serious self-harm, researchers have found

that people with ID who develop schizophrenia have a higher likelihood for pregnancy and birth complications than those with individuals with ID only (O'Dwyer, 1997). Bouras and colleagues (2004) postulate that due to increased observable psychopathology in people with comorbid ID and schizophrenia, these individuals may be at an increased risk of stigmatization compared to those with schizophrenia and no ID (Cookson & Dickson, 2010). Nevertheless some lack of familiarity with the phenomenology of schizophrenia as it presents in individuals with ID still exists (Cookson & Dickson, 2010; O'Brien, 2002).

A few researchers have suggested that symptomology presentation of schizophrenia in ID versus typically developing populations could differ (Welch, Lawrie, Muir, & Johnstone, 2011). Specifically, they found that when comparing ID and typically developing populations with schizophrenia, those with ID exhibited more negative symptoms of schizophrenia than did the typically developing group. However, limitations to this study were that individuals with IQs below 50 were not included in the study and individuals with borderline ID were included in the ID group. Another study investigated individuals with ID, schizophrenia, and epilepsy to those with ID and schizophrenia only (Arshad et al., 2011). The authors found that the presence of epilepsy was not related to an increase in risk for comorbid psychopathology, specifically, rates of schizophrenia were significantly lower among patients with ID and epilepsy when compared to ID only groups. However other researchers have stated that these lower rates in individuals with ID and epilepsy could be attributed to the calming mood-stabilizing effects of anti-epileptic drugs (Johannessen, 2008; Rogawski & Löscher, 2004) or possible diagnostic overshadowing (Hemmings, 2011; Mason & Scior, 2004). Similar to other types of psychopathology, schizophrenia is thought to be underdiagnosed in individuals with ID due to a concept called "diagnostic overshadowing," attributing psychopathological symptoms to the person's ID instead

of considering the existence of a comorbid psychological disorder (Carvill & Marston, 2002; Manor-Binyamini, 2010). In sum, due to the difficulties associated with differential diagnosis concerning individuals with ID and schizophrenia, as well as the increased cost of care for individuals with these comorbid conditions, it is important to have cost-efficient and effective tools such as the PIMRA-II to aid in making accurate diagnoses.

Major Depressive Disorder and Intellectual Disabilities

Many researchers have found that individuals with ID suffer from MDD with similar symptom presentation to typically developing individuals (Maïano, Morin, & Bégarie, 2011) with the prevalence of depressive episodes in this population being at least as high as in the general population (Hurley, 2008; Lunsky & Palucka, 2004). Researchers have found that the prevalence rate of MDD in adults with ID ranges from 2.2% to 30%, depending on the publication cited (Borthwick-Duffy, 1994; Davis, Judd, & Herman, 1997; Deb et al., 2001; Hermans & Evenhuis, 2010; Luckasson et al., 2002; White, Chant, Edwards, Townsend, & Waghorn, 2005). MDD is also regarded as one of the most common psychiatric disorders in individuals with ID (Cooper & Bailey, 2001; Cooper et al., 2007; Smiley & Cooper, 2003).

Several researchers have investigated the occurrence of MDD in individuals with ID, and results have suggested that both that MDD is underdiagnosed and that increasing age is a risk factor. Thorpe (1998) found that the risk of MDD increases with age among persons with ID and a prospective population-based study conducted by Richards, Maughan, and colleagues (2001) indicated that behavioral problems reported by age 15 for individuals with ID were associated with a high risk of MDD at mid-life. However, depressive disorders in individuals with ID, especially those with severe or profound ID, are often undetected or untreated (Ailey, 2009;

Herman & Evenhuis, 2010; Marston, Perry, & Roy, 1997; Lunsky, Bradley, Durbin, & Koegl, 2008).

There are multiple factors which may contribute to the failure to diagnose MDD in persons with ID (Langlois & Martin, 2008). Individual-level factors such as the inability to verbally express cognitive symptoms such as unreasonable feelings of guilt or worthlessness may lead to a failure to detect the presence of these emotions (Clarke & Gomez, 1999; Levitas, Hurley, & Pary, 2001; Marston et al., 1997; Ross & Oliver, 2002; Sovner, 1986). In addition to limited verbal abilities, Hartley and Birgenheir (2009) have found that individuals with ID and/or comorbid MDD have decreased nonverbal skills such as limited body movement, a restricted range of facial expression, infrequent smiling, speaking in a flat and quiet voice, and taking a long time to respond to the questions or comments of a social partner. Therefore, it is difficult to determine if these nonverbal deficits are manifestations of ID only or comorbid MDD symptoms. Lastly, obtaining a reasonable history can be problematic as clinicians must depend on available documents and information from caregivers and staff turnover may be high at some group home, supported living, or institutional settings (Hurley, 2008).

The *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision* (*DSM-IV-TR*; American Psychiatric Association [APA], 2000) delineates a standard set of criteria for MDD and this criteria is generally acceptable in individuals with mild and moderate ID (Tsiouris, 2001); however, the *DSM-IV-TR* MDD criteria has been questioned in regard to its appropriateness for individuals with profound and severe ID (Langlois & Martin, 2008). Several researchers question the use of strictly DSM-IV-TR criteria for MDD in individuals with severe and profound ID due to these individuals possessing limited abilities to verbally express symptoms. These researchers suggest the use of 'depressive equivalents' (e.g., aggression, self-

injury, yelling) in addition to the DSM-IV-TR diagnostic criteria (Hartley & Birgenhier, 2009; Hemmings, Gravestock, Pickard, & Bouras, 2006; Lowry & Sovner, 1992; Moss et al., 2000; Sovner & Hurley, 1983; Ross & Oliver, 2002). MDD has been shown to correlate with loss of adaptive skills and a rise in behavior problems in adults with ID (Cain et al., 2003; Kishore, Nizamie, & Nizamie, 2005; Marston et al., 1997; Matson, Rush, et al., 1999; McBrien, 2003). Nevertheless, some researchers have argued against the use of 'depressive equivalents' for diagnosis MDD in individuals with severe and profound ID, believing that they result in many individuals being falsely identified as having MDD (i.e., false positives; Charlot et al., 2007; Holden & Gitlesen, 2004).

Hurley (2008) investigated four groups of adults with ID: those with MDD, bipolar disorder, anxiety disorders, and controls (i.e., no Axis 1 diagnosis). Hurley (2008) found that a sad mood, crying, and anhedonia were the three symptoms that were useful in differentiating depressed patients from all other groups. Aggression and impulsivity were also found to be significantly greater in the depressed group than the anxiety or control group; however, no differences in these symptoms were found between the depressed and bipolar groups. Additional research is needed to determine the similarities and differences between MDD expression in individuals with ID and typically developing individuals (Allen & Davies, 2007; Hartley & Birgenheir, 2009).

Conduct Problems and Intellectual Disabilities

Conduct problems occur at higher rates in those with ID than those without ID, with researchers reporting rates between 10-17% in individuals with ID (Allen, Lowe, Matthews, & Anness, 2012; Emerson, Robertson, & Wood, 2005; Lambrechts & Maes, 2008; Matson, Neal, & Kozlowski, 2012; Smith & Matson, 2010a; Wallander, Koot, & Dekker, 2003). Conduct

problems are defined as behaviors which have an assortment of deleterious effects for the individual as well as for family members such as curtailing personal and social development, jeopardizing community based living arrangements, and restricting the person's quality of life (Bushbacher & Fox, 2003; Gardner & Moffatt, 1990; Rojahn et al., 2012). Common examples of these behaviors include aggression, pica, self-injury, property destruction, and rumination (Duncan et al., 1999; Matson & Boisjoli, 2007; Singh et al., 2006).

While challenging behaviors are damaging to an individual's quality of life, antisocial behaviors can be described as those behaviors that are outside the realm of the law (e.g., starting fights, threatening others, stealing, cruelty to animals, setting fires, raping someone, and/or getting into trouble with the law; Rutter, Giller, & Hagell, 1998). Though it has only recently become an area of study, researchers have found that antisocial personality disorder (APD) can co-occur in individuals with ID (Alexander & Cooray, 2003; Lindsay, 2007; Torr, 2003; Zigler & Bennett-Gates, 1999). APD, in general, is characterized by conduct disorder with an onset before the age of 15 years and a pervasive pattern of disregard for and violation of the rights of others (Morrissey & Hollin, 2011). Examples of behaviors exhibited by an individual with APD include deceitfulness, impulsivity, aggressiveness, and irresponsibility. While some researchers have stated that APD occurs at a higher rate in individuals with ID, it could be that individuals with ID are more likely to experience risk factors known to be associated with antisocial behavior such as physical or sexual abuse, inconsistent discipline, and/or environmental disadvantages (Dickson, Emerson, & Hatton, 2005).

Some researchers question the utility of applying the DSM-IV-TR (APA, 2000) APD diagnostic criteria to individuals with ID, postulating that the diagnostic criteria should be modified for those with ID (Morrissey & Hollin, 2011). One argument for modified criteria is

that some of the characteristics common to APD overlap with those inherent to individuals with ID (e.g., affective lability, self-harm, impulsivity, aggression, and other challenging behaviors; Alexander & Cooray, 2003). The etiology of APD in individuals with ID is unclear; however, some researchers have stated that it may be related to poor parenting; emotional, physical and/or sexual abuse; or environmental disadvantages (Hatton & Emerson, 2004; Hill, 2003; Marshall & Cooke, 1999; Robins, 1978). Other risk factors for APD reported in general population research include being male (Emler & Reichler, 1995), hyperactivity/attention problems and academic underachievement (Johnson, McCaskill, & Werba, 2001), inconsistent discipline regimes, parental depression or absence of parent (Loeber & Stouthamer-Loeber, 1986; Coleman & Hendry, 1999), and peer group pressure (Emler & Reichler, 1995).

Few researchers have investigated the prevalence rate of APD in those with ID (Morrissey & Hollin, 2011). Lindsay and colleagues (2006) studied a sample of 164 males with ID in three forensic settings and found that 39.5% possessed a personality disorder with APD being the most occurring personality disorder at 22.1% of all cases. Lindsay and colleagues (2006) also found in a male ID forensic population that APD diagnoses were more common in a high security forensic setting than in a medium or low secure forensic setting. Additionally, many topics in APD and ID research have yet to be investigated, such as the aspects of neurocognitive functioning in individuals with co-occurring APD and ID, the comorbidity of ID and APD in non-forensic populations with both males and females, and the investigation of APD in lower levels of ID (e.g., severe and profound; Morrissey & Hollin, 2011). Lastly, researchers have called for the development of more psychometrically robust measures to assess for the co-occurrence of APD and ID (Morrissey & Hollin, 2011) which is another reason the investigation of the PIMRA-II is a noteworthy endeavor. Provision of effective support, treatment, and care

for individuals with ID who engage in antisocial behavior continues to be a concern for health and social care services internationally (Johnston & Halstead, 2000; Lindsay, Hastings, Griffiths, & Hayes, 2007).

Paraphilic Disorders, Gender Dysphoria, Sexual Dysfunctions, and Intellectual Disabilities

Little research has been conducted concerning psychosexual disorders in individuals with ID (Craig, Lindsay, & Browne, 2010; Levine, Risen, & Althof, 2010). Part of this dearth of research could be attributed to the myth that individuals with ID possess decreased or absent sexual needs (Craig et al., 2010; Richards et al., 2008). Fletcher, Loschen, Stavrakaki, and First (2007) outline several factors which may conceal a psychosexual disorder diagnosis in individuals with ID: lack of communication skills and sexual language (Ruiter, 2000), limited sexual knowledge (Konstantareas & Lunsky, 1997; McCabe & Cummins, 1996), limited sexual experiences (Craig et al., 2010; Hingsburger, 1992), an idea that in individuals with ID sexuality is often ignored by staff (Held, 1993; McCabe & Schreck, 1992), and that people with ID are seen as asexual (Di Guilio, 2003; Karellou, 2003; King & Richards, 2002; Richards, Miodrag, & Watson, 2006).

Many researchers have reported that sexual problems in persons with disabilities including ID may arise from malfunction of physiological, psychological, community, or cultural systems (Griffiths, 2007; Richards et al., 2008). Sexual behavior of one person requires the coordinated functioning of both physiological and psychological systems. In addition, community and cultural systems can influence an individual's sexual behavior; individuals with ID are more intensely influenced by the rules and conventions of the community in which they live when compared to others; thus they more likely to have cultural and familial limitations imposed on sexual expression (Levine et al., 2010). While psychosexual disorders are not

commonly reported in persons with ID, researchers have found that individuals with ID, especially women, have an increased risk for sexual abuse (Saleh, Fedoroff, Ahmen, & Pinals, 2008).

Gender dysphoria, inclusive of persistent cross-gender identification, can co-occur in individuals with ID (Levine et al., 2010). In order to meet the criteria for gender dysphoria, an individual must not only identify with the opposite sex but also be uncomfortable with their current biological sex. Since gender dysphoria requires a significant degree of cortical ability, especially in terms of self-empathy for opposite-sex roles, individuals with ID are less likely than the general population to vocalize concerns about their gender identity (Griffiths et al., 2007; Ruiter, 2000).

Sexual dysfunctions are rarely reported in individuals with ID (Levine et al., 2010); however, it could be that mental professionals are just not asking their clients about these problems (Griffiths, 1999). Additionally, researchers have found that some developmental disabilities, such as Barr-Shaver-Carr syndrome and Klinefelter's syndrome, are associated with low testosterone levels, which could contribute to low sexual desire (Barr, Shaver, & Carr, 1963). Many researchers have called for an increase in sex education for individuals with ID, so that they can become more knowledgeable about sexual functioning and comfortable expressing problems with staff (Watson, Griffiths, Richards, & Dykstra, 2002). In fact, social skills groups focusing on sex education have been shown to be beneficial for individuals with ID (Levine et al., 2010) and measures such as the Socio-Sexual Knowledge Attitudes Assessment Tool-Revised (SSKATT-R; Griffiths & Lunsky, 2003) or the Short Dynamic Risk Scale (Quinsey, 2004) can be utilized to determine specific sexual topics that need further education for clients with ID.

Paraphilic disorders including: sexual arousal to non-human objects, the suffering and/or humiliation of oneself or others, children, or non-consenting persons, can occur in individuals with ID (Day, 1997; Murphy, Coleman, & Abel, 1983). Paraphilias can involve, but are not limited to, exhibitionism, fetishism, frotteuruism, pedophilia, sexual masochism, sexual sadism, tranvestic fetishism, and voyeurism (Craig et al., 2010). In fact, some researchers have found that individuals with ID, Fragile X syndrome, Asperger's disorder, or environmentally induced congenital disorders like fetal alcohol spectrum disorder may potentially have an increased likelihood of referral to a professional for sexuality issues (Attawood, 2007; Goldstein & Reynolds, 2005). However, it is inconclusive as to whether individuals with ID are at higher risk for paraphilic disorders; Lindsay (2002), in a review of the research on sex offenders with ID, concluded that there is no clear evidence of either an over or under representation of individuals with ID who sexually offend.

Anxiety Disorders and Intellectual Disabilities

Anxiety can be defined as the apprehensive anticipation of upcoming danger or misfortune with a feeling of nervousness or somatic symptoms of tension (Carraro & Gobbi, 2012; Pruijssers, van Meijel, & van Achterberg, 2010). In moderate amounts, anxiety can be considered normal, motivational, protective, and supportive in coping with hardship (Muris, 2007; Reid Smiley, & Cooper, 2011); however, pathological anxiety arises when the intensity or duration of anxiety is disproportionate to potential harm, or when there is not a recognizable danger to the person (Cooray & Bakala, 2005). Anxiety disorders are among the most common disorders prevalent in the typically developing population (Kessler, Chiu, Demler, & Walters, 2005) and are considered even more common in individuals with ID (Esbensen, Rojahn, Aman, & Ruedrich, 2003; Richards, Maughan, & Hardy, 2001; Sravakaki & Lunsky, 2007). Though

not many treatment protocols have been developed specifically for anxiety disorders in individuals with ID, the effect of an exercise program on anxiety in adults with ID has been shown to be effective in decreasing anxiety symptoms (Carraro & Gobbi, 2012). Future research is needed in this area.

Several authors have presented possible causes for the increased risk of anxiety disorders in individuals with ID including hereditary factors (Sullivan, Hooper, & Hatton, 2007), attachment problems (van Ijzendoorn, Scheungel, & Bakermans-Kranenburg, 1999), cognitive problems and lack of coping abilities (Cooray & Bakala, 2005), or a greater occurrence of trauma (Hastings, Hatton, Taylor, & Maddison, 2004). Some researchers have speculated that anxiety disorders may go underdiagnosed in persons with ID due to diagnostic overshadowing (Barnhill 2001, Pruijssers et al., 2010). Another confounding factor in the diagnosis of anxiety in individuals with ID is limitations in verbal skills. Some individuals with ID may not have the verbal skills to self-report symptoms such as fear of dying, feeling light-headed, derealisation, or dry mouth; therefore, reliance on caregiver report and behavioral observations is essential (Reid et al., 2011).

Gobrial and Raghavan (2012) investigated the prevalence of anxiety in children and adolescents with ID and autism. The authors assessed for anxiety using the Glasgow Anxiety Scale (GAS-ID; Mindham & Espie, 2003). Their results indicated that 32.6% of the sample with comorbid ID and autism had significant anxiety symptoms according to the GAS-ID. Reiss (1990) used the Reiss Screen with 205 people with ID in a day program in Chicago. Results yielded that 31.4% were rated to have a problem with anxiety.

Other researchers have examined specific anxiety disorders (e.g., Generalized Anxiety Disorder, Specific Phobias, Panic Disorder, Agoraphobia, and Social Phobia) in individuals with

ID (Reid et al., 2011). For example, Deb and colleagues (2001) found a prevalence of 2.2% for GAD, 4.4% for Phobias, and 0% for Panic Disorder. These results correspond with other researchers who have suggested that it is uncommon for an individual with ID to suffer from panic disorder due to lack of cognitive abilities essential to develop panic attacks (McNally, 1991). Additionally, Cooper and Bailey (2001) found a prevalence of 5.7% for GAD, 1.5% for Agoraphobia, and 6.6% for other phobias. Lastly, Bailey (2007) found a prevalence of 17.4% for GAD, 3.3% for agoraphobia, 2.5% for social phobia, and 0.8% for panic disorder. Other researchers have found that GAD is the most common anxiety disorder occurring in individuals with ID (Reid et al., 2011).

Mania and Intellectual Disabilities

Estimates of bipolar disorder in individuals with ID have ranged from 0.9% to 4.8%, exceeding the rates for the general population at 0.4% to 1.6% (Matson, González, Terlonge, Thorson, & Laud, 2007; Reid, 1972; Ruedrich, 1993). For example, Deb and colleagues (2001) examined the prevalence of mania and hypomania in adults with ID and found that 2.2% of their sample exhibited mania or hypomania. The diagnosis of bipolar disorders in individuals with ID can be difficult due to deficits in communication skills, atypical presentation, and an underreporting of manic symptoms by caregivers (Arumainayagam & Kumar, 1990; Hasan & Mooney, 1979; Matson, González, et al., 2007). Since some individuals with ID are nonverbal or have limited verbal skills, using methods that rely on self-report of feelings is not possible (González & Matson, 2006). To circumnavigate these problems, the use of observable symptoms has been emphasized (Lowry, 1998). These observable behaviors include excessive smiling, enthusiastic greeting of everyone, easily provoked to scream or swear, nights with four

or less hours of sleep, non-stop talking, rapid speech, episodes of singing, pacing, and excessive sexual behavior (Lowry, 1993).

Rojahn, Matson, Naglieri, and Mayville (2004) investigated correlations between the presence of behavior problems (i.e., self-injurious, stereoytyped, or aggressive/destructive behavior) and mania. These authors found that those with serious aggressive/destructive behavior were more likely to have higher scores on the mania subscale of the Diagnostic Assessment for the Severely Handicapped-Revised (DASH-II; Matson, 1995a). Sturmey, Laud, Cooper, Matson, & Fodstad (2010) found that a decreased need for sleep, restlessness, agitation, and irritability were associated with mania as measured by the DASH-II in a sample of adults with severe and profound ID. Matson, González, and colleagues (2007) also investigated mania in individuals with ID using a logistical regression procedure to measure differences between three groups (i.e., individuals with a bipolar diagnosis and ID, individuals with an Axis 1 disorder besides bipolar and ID, individuals with ID and no Axis 1 disorder). The authors used two measures: the DASH (Matson, 1995a) and the Parent Version of the Young Mania Rating Scale (Young, Biggs, Ziegler, & Meyer, 1978). Their results yielded that psychomotor agitation, decreased sleep, and changes in mood and aggression were significantly correlated with the diagnosis of mania. In addition, psychomotor agitation and disturbed sleep were significant predictors of a mania diagnosis (Matson, González et al., 2007).

González and Matson (2006) investigated the presence of mania symptoms in persons with ID across three groups of individuals (i.e., bipolar, psychopathology other than bipolar, and no Axis I diagnosis). The authors found that the bipolar group had significantly greater endorsements on the Parent Versions of the Young Mania Rating Scale and the DASH-II Mania subscale item "decreased need for sleep" than the other two groups. Lastly, Sovner (1989)

postulated that bipolar disorder in individuals with ID is more often atypical, chronic, or rapid cycling.

Laud (2007) investigated the relationship between mania and feeding/mealtime behavior problems in individuals with ID. Three groups were investigated (i.e., those with mania, those with an Axis I disorder other than mania, and controls with no Axis I diagnosis) using the Screening Tool for Feeding Problems (STEP; Matson & Kuhn, 2001). The author found significant differences across the three groups for nutrition related behavior problems, with the mania group more likely to "continue to eat as long as food was available" compared to the other two groups. Overall, because individuals with ID may have difficulties expressing themselves verbally, it is important for professionals assessing for bipolar disorder in individuals with ID to look for observational signs to aid in diagnosis. The development of the PIMRA-II will provide an observational informant-based tool to aid in bipolar diagnosis in those with ID.

Autism Spectrum Disorders and Intellectual Disabilities

ASDs are a group of neurodevelopmental disorders affecting approximately 1 in every 68 individuals which are characterized by impairments in socialization, communication, and restricted and/or repetitive behaviors and interests (RRBI; Fodstad, Matson, Hess, & Neal; 2009; Gillberg, 2010; Nyden et al., 2010; Wilkins & Matson; 2007). While ASDs can occur in both genders, males are more commonly diagnosed with ASDs than females by a ratio of 4:1 (Fombonne, 2003). Individuals with ID commonly have co-morbid ASDs (Hattier, Matson, Tureck, & Horovitz, 2011; Hermans & Evenhuis, 2010; Johansson, Gillberg, & Rastam, 2010) and this topic has garnered increased attention by researchers in recent years (Bradley, Summers, Wood, & Bryson, 2004; LoVullo & Matson, 2009). It is estimated that approximately 50-80% of individuals with ASD have comorbid ID (Baird et al., 2006; Bryson & Smith, 1998;

Fombonne, 2003; Gillberg, 1995) and around 7.5-40% of individuals with ID have comorbid ASDs (Bryson, Bradley, Thompson, & Wainwright, 2008; Cooper et al., 2007; LaMalfa et al., 2004; Wing & Gould, 1979). Researchers have also found that the more severe an individual's level of ID, the greater chances that ASD and associated problems will be comorbid (McCarthy et al., 2010; Vig & Jedrysek, 1999).

For clinicians, it is important to make distinctions between individuals with ID, those with ASDs, and those with ID and comorbid ASDs (Hattier et al., 2011), as it can be difficult to make differential diagnosis between the two conditions (Bhaumik et al., 2010). Specifically, it is cumbersome to determine whether the presence of "autistic-like" features is the consequence of brain damage/ID or ASD. For example, some autistic features such as impairments in communication and difficulties in socialization might be indicative of a low IQ rather than ASD (Bhaumik et al., 2010). For these reasons, effective assessment measures are needed to aid in differential diagnosis.

Common social deficits in individuals with ID and/or ASDs include avoiding eye contact, not following simple instructions, and disrupting activities of others (Matson, Mayville, Lott, Bielecki, & Logan, 2003). Smith and Matson (2010b) found that individuals with ID and comorbid ASDs possessed significantly more social impairments than individuals with ID alone. Additionally, individuals with ID and ASD have deficits in verbal and nonverbal communication (Seynhaeve, Nader-Grosbois, & Dionne, 2008). RRBIs, which are a symptom of ASDs, can be operationally defined as repetitive, nonfunctional behaviors that occur recurrently and interfere with daily functioning (Gabriels, Cuccaro, Hill, Ivers, & Goldson, 2005). Common examples of RRBIs in individuals with ASDs and comorbid ID include handflapping, mouthing of objects, jumping up and down, making complex hand movements, head moving, jerking, and echolalia

(Bowley & Kerr, 2000; Chowdhury, Benson, & Hillier, 2010; Howlin, 2006; Noll & Barrett, 2004).

Some researchers have reported that an IQ score is the best predictor of the severity of an individual's autistic symptoms, for example, those with lower IQs exhibit higher frequencies of RRBIs (Bartak & Rutter, 1976; Mayes & Calhoun, 2011). Additionally, individuals with ID and ASDs commonly exhibit challenging behaviors (Dawson, Matson, & Cherry, 1998; Matson, Kiely, & Bamburg, 1997; Reese, Richman, Belmont, & Morse, 2005). McCarthy and colleagues (2010) studied a group of adults with ID and found that those with comorbid ASDs were approximately four times more likely to engage in challenging behaviors than those without comorbid ASDs.

Assessment of Psychopathology in Individuals with Intellectual Disabilities

A current push in research on psychopathology in persons with ID has been to develop tests to evaluate mental health conditions (Gustafsson & Sonnander, 2002; Matson, Belva et al., 2012) as previous researchers have called for these developments (Einfeld & Tonge, 1996; Kellett, Beail, Newman, & Hawes, 2004). The identification of mental illness in individuals with ID is difficult as the diagnostic process relies on individuals' to self-report and some individuals with ID might have difficulties communicating symptoms (Konstantareas & Hewitt, 2001; Hemmings, 2006; Turner, 1989). Therefore, third-party measures that use caregivers, direct care staff, or family members as informants about the individual's symptoms are important pieces in the diagnostic process, as accurate diagnosis leads to appropriate treatment (Deb et al., 2001; Iverson & Fox, 1989; Roy, Martin, & Wells, 1997; Taylor, Hatton, Dixon, & Douglas, 2004). An interest in instruments designed to measure psychopathology in individuals with ID has developed in the past 25 years (Sturmey, Reed, & Corbett, 1991; Russell, 1997). While many scales have been created to assess the presence of co-morbid psychological disorders in individuals with ID, some of these measures have been infrequently studied (Matson, Belva et al., 2012). In the following paragraphs, measures that have been created to assess for psychopathology in individuals with ID with a modest research base will be presented in alphabetical order.

Adult Behavior Checklist (ABCL)

The ABCL was originally created to assess for psychopathology in the general population for individuals ages 18 to 59 (Achenbach & Rescorla, 2003). The ABCL consists of 123 items for which a caregiver rates the individual's behavior concerning each item on a 3-point Likert scale with "0" corresponding to "not true," "1" corresponding to "somewhat or sometimes true,"

and "2" corresponding to "very true or often true." Via factor-analytic methods, eight small-band syndrome scales were derived: Anxious/Depressed, Withdrawn, Somatic Complaints, Thought Problems, Attention Problems, Aggressive Behavior, Rule-Breaking Behavior, and Intrusive (Achenbach & Rescorla, 2003).

While the majority of the research on the ABCL involves non-ID populations, Tenneij and Koot (2007) have conducted some investigation of the utility of using the ABCL for populations with ID. These authors examined the reliability and validity of the ABCL using a sample of 124 adults with mild ID. Regarding reliability, Tenneij and Koot (2007) found Cronbach's alphas for the ABCL scales in the sample ranged from 0.69 to 0.95 with a mean alpha of 0.84, falling within the "good" range. In addition, all subscales, except for the Thought Problems subscale, showed internal consistencies in the "fair to excellent" range. Inter-rater reliability ranged from 0.57 to 0.76. Additionally, relationships between clusters of the Axis I DSM-IV-TR (APA, 2000) and scales of the ABCL provided support for the validity of the measure (Tenneij & Koot, 2007). While Tenneij and Koot (2007) have provided some evidence for the utility of the ABCL in individuals with ID, additional research of this scale utilized among participants with ID is needed.

Assessment for Dual Diagnosis (ADD)

The ADD is a 79-item instrument that was designed to screen for psychopathology among individuals with mild and moderate ID. Items on the scale are scored on three 3-point rating scales: (1) frequency, ranging from "0" for "not at all" through "2" for "more than 10 times;" (2) duration, ranging from "0" for "less than 1 month" through "2" for "over 12 months;" and (3) severity, ranging from "0" for "no disruptions or damage" through "2" for "caused property damage or injury." The measure consists of thirteen scales: Mania, Depression,

Anxiety, Post Traumatic Stress Disorder, Substance Abuse, Somatoform Disorder, Dementia, Conduct Disorder, Pervasive Developmental Disorder, Schizophrenia, Personality Disorders, Eating Disorders, and Sexual Disorders.

Matson and Bamburg (1998) conducted reliability and validity assessments on the measure. Regarding reliability, the authors found an internal consistency for the subscales ranging from .77 to .95 and inter-rater reliability ranging from .82 to 1.00 using Spearman rank correlations. Additionally, the authors investigated the test-retest reliability of the measure with a two-week inter-assessment interval. Pearson Product Moment correlations ranged from .82 to 1.00. Rojahn and colleagues (2011) have also investigated the reliability of the ADD and found similar results.

The concurrent validity of the ADD has also been established by comparing ADD scores to the Social Performance Survey Schedule (SPSS; Matson, Helsel, Bellack, & Senatore, 1983). Matson and colleagues (1983) found that higher scores on the ADD were related to greater impairment in social skills and higher levels of maladaptive behavior. Esbensen and Benson (2006) found robust concurrent validity when correlating the ADD Depression subscale with the Depressed Mood subscale on the Anxiety, Depression, and Mood Scale (ADAMS; Esbensen et al., 2003). While the ADD seems to be a very promising scale, fewer than six publications have reported on this measure, thus more research on the ADD is needed (Matson, Belva et al., 2012).

Brief Symptom Inventory (BSI)

The BSI (Derogatis, 1975; Derogatis, 1993; Derogatis & Melisaratos, 1983; Derogatis & Spencer, 1982) is a frequently used, 53-item self-report scale to measure global psychopathological distress (Switzer, Dew, & Bromet, 1999) and is a shorter version of the Symptom Checklist-90 (SCL-90-R; Derogatis, 1992). It consists of nine subscales:

Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. The BSI has both paper-pencil and computer-based administration available in English and Spanish. The measure takes approximately 8 to 10 minutes to complete and requires individuals to have at least a 6th grade reading level. Items are rated on a 5-point Likert scale, and the measure is normed for ages 13 and older. The BSI is noted to have an advantage in that it is brief in length and covers a wide variety of psychological disorders (Ruipérez, Ibáñez, Lorente, Moro, & Ortet, 2001). After administration of the BSI, the measure yields a Global Severity Index, which is the average score of all 53 items (Hoe & Brekke, 2008).

The BSI has been used with a wide range of adult populations (Hoe & Brekke, 2008); however, limited studies have investigated the utility of the BSI in a population with ID (Matson, Belva et al., 2012; Wieland, Wardenaar, Fontein, & Zitman, 2012). Kellett, Beail, Newman, and Frankish (2003) were among the first researchers to investigate the BSI in individuals with mild ID, testing 200 individuals in clinical, community, and forensic settings. Kellett and colleagues (2003) found the BSI to have coefficient alpha and split-half reliability scores ranging from 0.63 to 0.78 among individuals with mild ID. The discriminant validity of the BSI was also established to confirm that the symptom dimension scores in the three groups could not be accounted for by theoretically separate variables (Kellett et al., 2003). Overall, Kellett and colleagues (2003) were able to establish minimal psychometric properties of the BSI in individuals with mild ID.

In a follow up study, Kellett and colleagues (2004) investigated the construct validity of the BSI using an exploratory factor analysis with a sample of 335 participants with ID. The proposed eight-factor structure appeared psychometrically robust in the context of the

exploratory analysis. Lastly, Wieland and colleagues (2012) studied a group of 224 psychiatric outpatients with either borderline or mild ID and the utility and psychometric properties of the BSI were investigated. The results suggested that the internal consistencies of the BSI subscales ranged from 0.70 to 0.96. Additionally, discriminant validity was shown for the Depression, Anxiety, and Phobic Anxiety subscales. A confirmatory factor analysis also showed that the BSI could be described by the same nine-factor model that has been reported in previous studies. While the BSI has the potential to be a useful tool, more research is needed in populations with ID.

Child Behavior Checklist (CBCL)

One of the most frequently studied instruments used in assessing for emotional and behavioral problems in children is the CBCL (Achenbach & Edelbrock, 1983; Embregts, 2000; Matson, Belva et al., 2012). This measure has been investigated in over 30 different countries and societies (Ivanova et al., 2007; Rescorla et al., 2007). The CBCL was designed to assess for behavioral problems and competencies of children ages 4 to 18 years of age, via parent or caregiver report. Parents and caregivers rate each of 118 problem items on the CBCL using a 3-point Likert scale with "0" indicating "not true," "1" indicating "somewhat or sometimes true," and "2" indicating "very true or often true." The 118 items on the CBCL make up two broad-band factors (e.g., Internalizing Behaviors and Externalizing Behaviors) and nine narrow-band factors (e.g., Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, Aggressive Behavior, and Other). These scales were derived using a factor analysis (Achenbach & Rescorla, 2001). Raw scores for each scale are converted to norm-referenced *T*-scores ($M = 50$, $SD = 10$), and separate norms are provided for males and females, as well as within the 6 to 11 and 12 to 18 year age ranges.

A large number of studies have focused on psychometrics (e.g., reliability and validity) of the CBCL. Achenbach (1991) assessed the test-retest reliability of the CBCL item scores using intra-class correlations (ICCs) and found an ICC of 0.95 for the 118 problem items. Achenbach (1991) also found inter-parent correlations between problem scales to range from 0.48 to 0.80. Verhulst, Van der Ende, and Koot (1996) investigated test-retest reliability of the Dutch version of the CBCL and found overall Pearson *r's* for the problem scales to be 0.84. Additionally, on the problem scales, mean Pearson *r* correlations ranged from 0.65 to 0.81. With regards to validity, convergent validity has been established between the CBCL and the Conner's Parent Questionnaire and Revised Behavior Problem Checklist (Quay, 1983), other psychometrically established instruments used in assessing for emotional and behavioral problems in children.

Although the CBCL was not originally designed to be used on children with ID, some researchers have investigated use of the CBCL for this population. Embregts (2000) investigated the reliability of the CBCL for the assessment of behavioral problems in children and youth with mild ID. In the study, a sample of 42 children with ID ranging in age from 10 to 18 years was used and inter-rater and test-retest reliability of the CBCL was investigated. Embregts (2000) found, at item level, mean kappas for the inter-rater and test-retest reliability were 0.27 and 0.52, respectively. The author's conclusion was that the CBCL may not always represent a reliable checklist for the assessment of psychopathology in children and youth with mild ID. Borthwick-Duffy, Lane, and Widman (1997) examined the factorial validity of the CBCL for children with ID, and the results of their factor analysis did not confirm the factors established in earlier studies of the CBCL with children without ID. While the CBCL is a psychometrically robust tool for the assessment of behavior and emotional problems in children without ID, further research is needed on the CBCL's utility for children with ID.

Developmental Behavior Checklist (DBC)

The original DBC-Primary Carer Version (DBC-P) was created to assess for emotional and behavioral disturbances in children and adolescents ages 4 to 18 years with ID. The 96-item, multiple-choice checklist provides five subscales derived using factor analysis: Disruptive, Self-Absorbed, Communication Disturbance, Anxiety, and Social Relating (Bontempo et al., 2008; Clarke, Tonge, Einfeld, & Mackinnon, 2003). The DBC-P yields five subscales scores for the aforementioned subscales and a total behavior problem score. The total behavior problem score is calculated adding all 96 items, and a total score of 46 or greater has been determined as the clinical cut-off (Einfeld & Tonge, 1992).

Reliability and validity of the DBC-P have been investigated (Einfeld & Tonge, 1995). With regards to reliability, the authors found strong inter-rater reliability between parents, nurses, and teachers. Test-retest reliability was also found to be robust by asking 63 pairs of parents, residential care workers, and nurses to complete the questionnaire two weeks apart (Einfeld & Tonge, 1995). Einfeld and Tonge (1995) established convergent validity of the DBC-P by finding strong correlations of its total scores with the Adaptive Behaviors Scales School Edition (Lambert & Windmiller, 1981). Within the DBC-P is the DBC-Early Screen (DBC-ES), which consists of 17 items that have proven effective as a screen for autism in young children with developmental disability (Gray & Tonge, 2005; Gray, Tonge, Sweeney, & Einfeld, 2008). In addition to the 96-item DBC-P, a 24-item short form of the measure, the DBC-P24, has also been developed (Taffe et al., 2007).

The DBC-P was used as a starting point to develop a caregiver-completed checklist of emotional and behavioral disturbance for adults with all ranges of ID, the Developmental Behaviour Checklist for Adults (DBC-A; Mohr, Tonge, & Einfeld, 2005). The DBC-A consists

of 107 items and can be completed by caregivers that have finished at least primary-level schooling. The DBC-A yields a total score that provides a global measure of psychopathology, and six factors have also been derived from a factor analysis (Mohr et al., 2011). The test-retest reliability of the DBC-A has been investigated using two groups of caregivers, family members and paid accommodation staff members, with acceptable levels of reliability (0.72 and 0.69 respectively; Mohr et al., 2005; Mohr et al., 2011). Additionally, Mohr, Tonge, Taffe, and Einfeld (2012) have established normative data for the DBC-A for adults ages 18 to 85. The DBC-A has been translated to German, and psychometric properties and norms of the translated measure have been investigated (Steinhausen & Metzke, 2011). Thus far, no studies have investigated the validity of the DBC-A. Further research is needed on this measure in adults with ID.

Diagnostic Assessment for the Severely Handicapped (DASH-II)

The DASH-II (Matson, Gardner, Coe, & Sovner, 1991) is an 84-item instrument designed to identify potential psychopathology and measure associated symptoms in individuals with severe and profound ID (Matson, 1995a; Matson et al., 1991). The scale includes 13 subscales: Impulse Control, Organic Problems, Anxiety, Mood Disorders, Mania, ASD/Autism, Schizophrenia, Stereotypies, Self-Injurious Behavior, Elimination Disorders, Eating Disorders, Sleep Disorders, and Sexual Disorders. The DASH-II is administered to a caregiver of the individual who is asked to rate the individual's frequency of behaviors based on the past two weeks. The caregiver who rates the individual must have known the individual for at least six months.

Ratings of behavior frequency include "0" indicating "not at all, not a problem," "1" indicating "between one to ten times," and "2" indicating "more than ten times." The duration

and severity of the behavior is also assessed for items that occur at a frequency of "1" or "2." The duration of behavior can be rated "0" for "less than a month," "1" for "1 to 12 months," or "2" for "over 12 months." Lastly, the intensity of the behavior is assessed by its consequences, rated as "0" for "caused no disruptions or damages," "1" for " caused no damages but interrupted the activities of peers, family, or staff members at least once," or "2" for "caused injury or property damage at least once."

Norms for the DASH-II have been established using 506 individuals with severe and profound ID from four institutions in Louisiana and Wisconsin (Matson, 1995a). In addition, the reliability of the DASH-II has been investigated with inter-rater reliability being high with severity ratings yielding r = .96, duration ratings yielding r = .95, and frequency ratings yielding r = .91 (Matson, 1995a). The internal consistency of the DASH-II was also investigated with alpha ratings ranging from .20 - .84 for the 13 subscales. Further, Matson and colleagues (1991) investigated the factor structure of the DASH-II, and a factor analysis yielded six scales: Emotional Lability, Antisocial Behavior, Language Disorder, Social Withdrawal/Stereotypy, Eating Disorder, and Sleep Disorder.

Paclawskyj and colleagues (1997) investigated the convergent validity of the DASH-II by comparing it to the Aberrant Behavior Checklist (ABC; Aman & Singh, 1986). These authors used a sample of 233 individuals with severe or profound ID who were residents of a large developmental center in Louisiana. The researchers' results indicated that the DASH-II and ABC total scores correlated at .75. In addition, the Depression, Mania, Organic Disorders, and Impulse Control Disorder subscales on the DASH-II all correlated highly (r = .50 or above) with the Irritability and Hyperactivity subscales from the ABC. Lastly, both the ASD/Autism and

Stereotypies subscales on the DASH-II correlated strongly with the Stereotypies subscale of the ABC (r = .65 or above).

Additionally, Sturmey, Matson, and Lott (2004) investigated the convergent and discriminant validity of the DASH-II. The authors found that the DASH-II exhibited strong convergent validity with other measures of maladaptive behaviors, such as the Negative Scales of the Matson Evaluation of Social Skills for Individuals with Severe Retardation (MESSIER; Matson, 1995b) and the ABC. Good discriminant validity was found between the DASH-II and the adaptive behavior scales of the MESSIER and the Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984).

A number of the subscales of the DASH-II have been validated. Matson and Smiroldo (1997) investigated the internal consistency and validity of the mania subscale of the DASH-II using a sample consisting of 22 individuals that resided in a large developmental center in Louisiana. The results yielded that the mania subscale of the DASH-II was internally consistent (α = .79), and that the DASH-II could be used to accurately classify those with mania versus control individuals, as 90.9% of the manic individuals and 100% of the controls were correctly classified. Belva, Matson, Hattier, Kozlowski, & Bamburg (2011) investigated the convergent validity of the ASD/Autism Scale of the DASH-II with the Autism Spectrum Disorders-Diagnostic Adult (ASD-DA; Matson, Boisjoli, Gonzalez, Smith, & Wilkins, 2007). Using 278 adults residing in two large supports and services centers in the southeastern region of the United States, the authors found that the ASD-DA total scores and all subscale scores correlated robustly with the ASD/Autism Scale of the DASH-II. Overall, the DASH-II is a psychometrically robust measure for assessment of co-morbid psychopathology in individuals with severe and profound ID.

Nisonger Child Behavior Rating Form (NCBRF)

The NCBRF (Aman, Tasse, Rojahn, & Hammer, 1996) is a 76-item, informant-reported behavior rating scale that was adapted to assess children and adolescents between the ages of 3 to 16 years with ID (Tassé, Aman, Hammer, & Rojahn, 1996). At the time of its development, the authors noticed a need for assessment tools that could be used specifically with children with ID (Aman, 1991). The original Child Behavior Rating Form (CBRF), developed by Edelbrock and Rancurello at the Western Psychiatric Institute and Clinic in Pittsburgh (Edelbrock, 1985), was modified and adapted for use in a child population. Aman and colleagues (1996) used a sample of 369 outpatients referred for evaluation at the Nisonger Center for Mental Retardation and Developmental Disabilities to create the scale. An individual that has known the child for at least a month is needed to complete the measure, which takes approximately 7-8 minutes to finish (Aman et al., 1996; Tassé et al., 1996). In addition to English, the NCBRF has been translated into French with established psychometrics (Tassé, Morin, & Girouard, 2006)

The NCBRF consists of two versions, a parent and teacher version, each with two sections (i.e., Social Competence and Problem Behaviours). The Social Competence section consists of 10 items depicting adaptive/prosocial types of behavior (e.g., "was cheerful or happy"), and items are rated on a 4-point Likert scale in which "0" represents "not true" and "3" represents "completely or always true." The Problem Behavior section contains a variety of maladaptive behaviors (e.g., "defiant, challenges adult authority") that are rated on a 4-point Likert scale with "0" representing "did not occur or was not a problem" to "3" which represents "occurred a lot or was a severe problem." The scoring system on the Problem Behaviors section attempts to take into account both the rate of occurrence and the severity of the behavior.

The parent version of the NCBRF can be completed by a parent, mature sibling, or caregiver (Tassé et al., 1996). The Social Competence section consists of two subscales labeled as Compliant/Calm and Adaptive Social. Additionally, the Problem Behavior section possesses 60 items that load on six subscales, found using factor analysis (Aman et al., 1996): Conduct Problem, Insecure/Anxious, Hyperactive, Self-Injury/Stereotypic, Self-Isolated/Ritualistic, and Overly Sensitive. The teacher version of the NCBRF may be completed by a teacher or teacher's aide. Both the Social Competence and Behavior Problem items are similar to those on the parent version with minor changes. Aman and colleagues (1996) found robust internal consistency for teacher ratings ($\alpha = .87$) and parent ratings ($\alpha = .85$). Robust inter-rater reliability and convergent validity between the NCBRF and the ABC (Aman, Singh, Stewart, & Field, 1985) was also found. A follow-up study with the same sample also found subscale score differences by age (Tassé et al., 1996).

Norris and Lecavalier (2011) investigated the factorial, criterion, and convergent validity of the NCBRF parent version using data from 399 children aged 5 to 18 years old. The authors found that the analysis of the Social Competence items indicted a good fit using the root mean square error of approximation (RMSEA = .05), supporting the two-factor structure originally proposed by Aman and colleagues (1996), whereas the Problem Behavior items indicated a mediocre fit (RMSEA = .08). With regards to criterion validity, the authors compared children with disruptive behavior disorders (e.g., ADHD, Oppositional Defiant Disorder, and/or Conduct Disorder) to those without and found that those with disruptive behavior disorders scored significantly higher on the Problem Behavior subscales and significantly lower on the Social Competence subscales. Lastly, Norris and Lecavalier (2011) investigated the convergent validity of the NCBRF with the Developmental Behavior Checklist (DBC; Einfeld & Tonge, 2002) and

found correlations between similar subscales ranging from *r* = .37 - .85, depending on comparisons.

Rojahn and colleagues (2010) conducted a psychometric evaluation of the NCBRF using a sample of 237 ethnically diverse children and adolescents with ID who ranged in age from 4 to 22 years. Teacher-teacher agreement for the two NCBRF prosocial subscales was .47, teacher test-retest was .71, and teacher-parent agreement was .08. Internal consistency for the NCBRF prosocial subscale was .72, and convergent validity between the NCBRF and the Behavior Problems Inventory-01 (BPI-01; Rojahn, Matson, Lott, Esbensen, & Smalls, 2001) was robust. Lastly, the authors conducted a confirmatory factor analysis, which suggested a poor fit between the present and original NCBFR factor structures.

Psychiatric Assessment Schedule for Adults with a Developmental Disability (PAS-ADD)

The PAS-ADD (Moss, Prosser, Costello, Simpson, & Patel, 1996; Moss et al., 1998) is a screening tool designed to identify possible co-morbidity of psychiatric disorders in individuals with ID (Allen et al., 2012) and is part of a three-tiered interview pack, comprised of the PAS-ADD interview, Mini PAS-ADD, and the PAS-ADD Checklist. The PAS-ADD is a semi-structured interview that produces research diagnoses and involves interviewing both the patient and an informant (Moss et al., 1997). Moss and colleagues (1997) investigated the PAS-ADD interview and found that it possessed good validity in relation to psychotic symptoms and depressive symptoms. In addition, Moss and colleagues (1997) compared PAS-ADD interview scores to referrers' diagnoses and found that, of the 58 diagnoses produced by the PAS-ADD, 44 were in agreement with the referrer. Lastly, the PAS-ADD has been shown to have a high degree of predictive validity (Hatton & Taylor, 2008).

The Mini PAS-ADD (Moss, 2002) is a 66-item questionnaire used to assess for psychopathology in individuals with ID. The authors specifically state that the Mini PAS-ADD is used for case identification rather than diagnosis (Devine, Taggart, & McLornian, 2010). The measure contains six subscales (i.e., Depression, Anxiety, Hypomania, Obsessive Compulsive Disorder [OCD], Unspecified Disorder [including Dementia] and Autistic Spectrum Disorder), and each item has an accompanying probe to assist those informants who have less experience rating psychopathology (Moss, 2002). All items are rated depending on presence and/or level of severity of the individual's behavior over the past four weeks. At this time, there have been no reported psychometric studies conducted on the Mini PAS-ADD Interview (Moss, 2002).

The PAS-ADD Checklist, the third measure in the series of PAS-ADD tools, was originally designed to be easy and quick to administer and able to be used to make informed referral decisions (Hatton & Taylor, 2008). The PAS-ADD Checklist was derived from the PAS-ADD interview (Costello, Moss, Prosser, & Hatton, 1997; Moss et al., 1997). The PAS-ADD Checklist was originally 29 items (Moss et al., 1996) but was later revised to a 25-item checklist (Moss, 2002). The informant completing the checklist should know the individual for at least six months. Moss and colleagues (1998) stated that, while the PAS-ADD Checklist is designed to be used by non-experts, more reliable information may be obtained by informants who study the included introduction and training manual. The authors also state that if an individual's checklist score surpasses one of the thresholds, the subsequent clinical assessment will likely show that the individual meets ICD-10 criteria for a psychiatric disorder. In its original version, the PAS-ADD Checklist items were scored on a 4-point scale indicating the presence and severity of each symptom for the individual in the past four weeks (Moss et al., 1996; Moss et al., 1998).

The revised version of the 25-item PAS-ADD Checklist yields five scores that are combined into three final subscales: Affective/Neurotic Disorder, Possible Organic Condition, and Psychotic Disorder, with threshold scores indicating a possible psychological diagnosis (Moss et al., 1998). These three subscales were derived by examining ICD-10 symptom clusters rather than an empirical factor analysis (Moss et al., 1998). A few researchers have investigated the PAS-ADD Checklist using these three subscales and have reported adequate psychometric properties (e.g., internal reliability, inter-rater reliability) and robust sensitivity in detecting psychological problems (Moss et al., 1998; Simpson, 1998; Sturmey, Newton, Cowley, Bouras, & Holt, 2005). For example, Moss and colleagues (1998) found an internal consistency using Cronbach's alpha of $\alpha = .87$ with subscales ranging from $\alpha = .51$ - .84, whereas Sturmey and colleagues (2005) found internal consistency of subscales ranging from $\alpha = .60$ - .80. Zeilinger, Weber, and Haveman (2011) also investigated the psychometric properties of the PAS-ADD Checklist in a German sample and found a factor structure similar to the English version and internal consistency of $\alpha = .83$ for the total scale.

In addition to deriving subscales using clinical diagnostic criteria, researchers have also derived subscales for the PAS-ADD Checklist using factor analysis. Moss and colleagues (1998) conducted a factor analysis on the PAS-ADD Checklist using a sample of 201 adults with ID living in the community. Their factor analysis yielded eight factors: Depression 1, Restlessness, Phobic Anxiety, Psychosis, Hypomania, Autistic Spectrum, Depression 2, and Non-Specific. Additionally, Sturmey and colleagues (2005) conducted a factor analysis on the PAS-ADD with 226 adults with ID and results yielded only one factor relating to mood. Hatton and Taylor (2008) also investigated the factor structure of the PAS-ADD Checklist using a sample of 1,155 adults with ID living either in the community, in residential care, or in hospital settings in

England. The authors conducted both exploratory and confirmatory factor analyses and found an inconsistent factor structure for the PAS-ADD Checklist. The authors recommended to refrain from use of the PAS-ADD Checklist to identify specific types of psychopathology, but rather to use the checklist as a screening tool for general psychopathology (Hatton & Taylor, 2008). The PAS-ADD Checklist is a promising measure of psychopathology in individuals with ID, but still is in need of further research.

Psychopathology Checklist for Adults with Intellectual Disability (P-AID)

The P-AID (Hove & Havik, 2008) is a screening instrument that was created based on criteria from the Diagnostic Manual-Intellectual Disability (DM-ID; Fletcher et al., 2007) using a sample of 593 adults in Western Norway with mild to profound ID. Seven checklists make up the P-AID: Dementia, Psychosis Spectrum, Depression, Mania, Anxiety, Obsessive-Compulsive Disorder, and Problem Behavior Checklists. Hove and Havik (2008) investigated the internal consistency of the P-AID, and an item analysis revealed total checklist alpha values between 0.83 and 0.93 for the mental disorder checklists and between 0.89 and 0.96 on the problem behavior checklists, signifying acceptable and exceptional internal consistency. Inter-rater reliability ranged between 0.49 to 0.88 for the mental disorder checklists and between 0.89 to 0.47 for the problem behavior checklists. Hove and Havik (2008) also conducted a preliminary analysis of sensitivity and specificity on the P-AID and found that the measure showed a sensitivity of 30%, specificity of 89%, and an accuracy of 64%. Overall, the P-AID identified 68% of those with a history of psychopathology. While the P-AID appears promising, the Hove and Havik (2008) article is the only publication on this measure to date. Additional study, especially in the area of validity of the P-AID, is warranted (Matson et al., 2012).

Psychopathology Instrument for Adults with Mental Retardation (PIMRA)

The first scale for assessment of psychopathology in individuals with ID was the Psychopathology Instrument for Adults with Mental Retardation (PIMRA; Kazdin, Matson, & Senatore, 1983; Matson, Kazdin, & Senatore, 1984; Senatore, Matson, & Kazdin, 1985). This scale is still in widespread use today and was modeled after popular structured interviews at the time, such as the Schedule for Affective Disorders and Schizophrenia (Endicott & Spitzer, 1978). While some psychologists in the 1980s were still questioning whether individuals with ID could have co-morbid psychological disorders, the PIMRA was as much a measure for psychopathology in persons with ID as it was a statement about the existence of these conditions (Matson et al., 2012).

The PIMRA has informant and self-report versions. The informant version of the PIMRA is administered by a professional who have at least a master's degree in a health-related discipline (e.g., psychology, social work, and nursing). The person who is being interviewed should be a caregiver who has known the individual for at least six months. The interview should take place in a quiet area and both the interviewer and the informant should receive a copy of the PIMRA. The interviewer should read each question slowly to the informant, tell the informant to ask questions if they are unfamiliar with any terminology, and provide explanations if needed. The informant should respond to each question either "yes" or "no" with regards to whether that item applies to the individual in question. After completion of the PIMRA, the interviewer should score the measure by adding up the total number of endorsements for each subscale, as well as the total score, on the scoring sheet. Interpretation of the PIMRA should only be made by those with appropriate training. For the self-report version of the PIMRA, the interviewer should explain the purpose of administering the measure, then slowly read each item

to the individual being assessed and record his or her responses. After completion, the results should be scored and interpreted in the same manner as in the informant version.

The PIMRA consists of 56 items representing seven classes of psychopathology based on the DSM-III criteria (i.e., Schizophrenia, Affective Disorder, Psychosexual Disorder, Adjustment Disorder, Anxiety Disorder, Somatoform Disorder, and Personality Disorder) and one additional subscale representing Inappropriate Mental Adjustment. Each of the eight subscales contains seven items that must be either endorsed or denied.

The psychometrics of the PIMRA have been previously studied. Matson, Kazdin, and Senatore (1984) first investigated the reliability of the PIMRA using a sample of 110 adults with borderline to severe ID who were assessed individually at an outpatient clinic at the University of Pittsburgh School of Medicine. Both self-report and informant report versions of the PIMRA were investigated. Internal consistency using coefficient alphas was .85 for the self-report and .83 for the informant report and .88 for the self-report and .83 for the informant report using Spearman-Brown formulas. Test-retest reliability was computed for 22 subjects on the self-report version and 19 subjects on the informant report versions using a 5-month interval, and moderate to high statistically significant correlations were found on both versions. Watson, Aman, and Singh (1988) further established the reliability of the PIMRA by administering the measure to 160 adults with developmental disability. Ninety-five of the individuals lived in the community and attended a workshop training center, whereas the other 65 lived in a residential facility. Internal consistency, calculated using coefficient alpha, ranged from .45 to .73 across settings and report formats with a mean of .64 for self-report and .66 for informant report.

Watson and colleagues (1988) also investigated the test-retest reliability of the PIMRA for 32 subjects after a five month period. Spearman correlations for each subscale were as

follows: Schizophrenia (.29), Affective Disorder (.26), Psychosexual Disorder (.15), Adjustment Disorder (.34), Anxiety Disorder (.29), Somatoform Disorder (.56), Personality Disorder (.47), and Inappropriate Mental Adjustment (.40). Test-retest reliability for the total score was .65. A bevy of other researchers have investigated the internal consistency and have reported acceptable levels (Iverson & Fox, 1989; Linaker, 1991; Minnen, Savelsberg, & Hoogduin, 1994; Sturmey & Ley, 1990). Additionally, many researchers have investigated inter-rater reliability of the informant version of the PIMRA and found moderate levels of reliability (Iverson & Fox, 1989; Linaker & Nitter, 1990; Minnen et al., 1994).

Kazdin and colleagues (1983) investigated the concurrent validity of the PIMRA, finding that individuals with ID identified as depressed according to the informant scores on the PIMRA possessed higher Depression subscale scores than those not identified as depressed on the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the Zung Self-Rating Depression Scale (Zung, 1965). Minnen and colleagues (1994) also investigated the convergent validity of the PIMRA by comparing it to the Reiss Screen for Maladaptive Behavior (RSMB; Reiss, 1988). The authors reported a strong relationship between the PIMRA total scores and RSMB total scores. The criterion validity of the PIMRA has also been investigated by comparing single subscales of the PIMRA against DSM-III-R and DSM-IV criteria. Swiezy, Matson, Kirkpatrick-Sanchez, and Williams (1995), using a sample of 65 adults with mild and moderate ID, found that the Schizophrenia and Affective subscales of the PIMRA yielded correlations of $r = 0.43$ and $r = 0.58$, between the two subscales and the core criteria endorsed by staff from a clinical psychologist's interview on a DSM-III-R checklist for schizophrenia and depression respectively.

Furthermore, the PIMRA has been investigated internationally. Gustafsson and Sonnander (2002) established the inter-rater reliability, internal consistency, item grouping, criterion validity, and concurrent validity of the PIMRA using a Swedish sample. The PIMRA has also been translated into other languages and evaluated in a multitude of countries such as New Zealand (Aman, Watson, Singh, Turbott, & Wilsher, 1986), Great Britain (Sturmey & Ley, 1990), Norway (Linaker, 1991; Linaker & Helle, 1994), the Netherlands (Minnen et al., 1994) and Italy (Balboni, Battagliese, & Pedrabissi, 2000). Overall, the PIMRA has strong psychometric properties and has proven to be useful in assessing for psychopathology in individuals with higher levels of ID.

Reiss Screen for Maladaptive Behavior (RSMB)

The RSMB is one of the older and better-established scales assessing for psychopathology in individuals with ID. The RSMB was developed to meet the need for a standardized screening instrument to be used by non-professionals for mental health disorders in persons with ID, not as a standalone diagnostic tool (Havercamp & Reiss, 1997; Reiss, 1988). At the time of its publication, the concept of dual diagnosis (the co-existence of ID and psychopathology) had only recently gained acceptance (Reiss, 1988). Caregivers use this instrument to rate an individual's severity of psychopathology on 36 items, and a high score indicates a need for referral for more detailed evaluation (Havercamp & Reiss, 1997). The raters are required to know the participants they are rating for at least three months (Reiss, 1988). Informants rate the degree to which an item applies to the individual by endorsing that the item is "no problem," "a problem," or "a major problem" in the life of the individual (Havercamp & Reiss, 1997). Each of the 36 items also includes a simple definition and common behavioral

examples to assist raters. Raters are asked to take into consideration severity, frequency, and the consequences of the behavior when making their ratings.

The measure has been shown to have acceptable to good psychometric properties including internal (Reiss, 1988; Reiss, 1990), inter-rater (Reiss, 1988), and test-retest (Rojahn, Warren, & Ohringer, 1994) reliabilities. The criterion (Reiss, 1988; Reiss, 1990) and concurrent (Davidson, 1988; Reiss, 1988, Reiss, 1990) validity of the RSMB has also been established. Sturmey and Bertman (1994) also found modest to good concurrent validity for the total score of the PIMRA (Matson, 1988) and the ABC (Aman & Singh, 1986). Walsh and Shenouda (1999) showed that the ABC and the Adaptive Behaviour Subscale (ABS; Nihira, Leland, Lambert, 1993) predicted the RSMB total score well in a clinical sample. Additionally, the factor content has been derived by an exploratory factor analysis using a sample of 306 adolescents and adults resulting in the following scales: Aggressive Behavior, Autism, Psychosis, Paranoia, Depression-Behavioral Signs, Depression-Physical Signs, Dependent Personality Disorder, and Avoidant Disorder (Benson & Reiss, 1984; Davidson, 1988; Reiss, 1988). Havercamp and Reiss (1997) also tested the factorial stability of the RSMB, and reasonable fit was demonstrated in a sample of 448 individuals with mild to profound ID. Cut-off scores to differentiate subtypes of maladaptive behaviors for individuals with Prader-Willi Syndrome using the RSMB have also been investigated (Hartley, MacLean, Butler, Zarcone, & Thompson, 2005).

Reiss and Valenti-Hein (1994) investigated the RSMB by evaluating 583 children and adolescents with ID. Two psychologists and two psychiatrists judged the face validity of the scale. Internal consistency for the RSMB was also found to be good for the ten subscales, ranging from $\alpha = .63 - .92$. In addition, the authors found that individuals with ID and comorbid psychopathology possessed higher elevations on the RSMB than those persons with ID only.

Walsh and Shenouda (1999) found strong convergent validity between the RSMB and the ABC (Aman et al., 1985) using a sample of 284 individuals. Specifically, RSMB subscale scores correlated with Irritability, Lethargy, and Hyperactivity subscales on the ABC.

Authors have also translated the measure into other languages. Gustafsson and Sonnander (2002) investigated the psychometric properties of the Swedish version of the RSMB. The authors found moderate-to-low inter-rater agreement and good internal consistency. Additionally, the authors found that mental health concerns most common in their sample included anxiety, depression, self-injurious behaviors, and adjustment problems (Gustafsson & Sonnander, 2002). A Dutch version of the RSMB has also been investigated (Minnen, Savelsberg, & Hoogduin, 1995), and the authors found that the subscales could significantly differentiate between people with mild ID who had a diagnosis and those who did not have a diagnosis. In conclusion, the RSMB has established psychometrics and has been proven to be useful as a screening device; however, some authors have suggested the development of a more comprehensive set of items (Prout, 1993).

Significance and Purpose of the Study

While there are some measures available to assess for psychopathology in individuals with ID, there is still a dearth of psychometrically robust measures available to assess for psychopathology in adults with mild and moderate ID. Measures such as the CBCL, DBC, and NCBRF are psychometrically robust, but are only applicable on child populations with ID. The DASH-II is also psychometrically sound, but limited to an adult population with severe and profound ID, whereas the BSI is psychometrically solid but only for typically developing adults. Measures such as the DBC-P and P-AID are promising but still need further research to establish their psychometric properties. Lastly, the ADD, RSMB, and PAS-ADD Checklist are psychometrically strong measures to assess for psychopathology in adults with mild and moderate ID, but lack the comprehensiveness that the PIMRA-II would provide. These reasons make the creation and investigation of the PIMRA-II a noteworthy endeavor.

Authors have also called for the investigation of Axis I comorbidity in individuals with ID including schizophrenia (Morgan et al., 2008), MDD (Ailey, 2009; Lunsky & Palucka, 2004; Morin, Rivard, Cobigo, & Lépine, 2010), manic symptoms (González & Matson, 2006), anxiety disorders (Hagopian & Jennet, 2008), APD (Morrissey & Hollin, 2011), and psychopathology in general (Matson, 1995a; Taylor & Novaco, 2013; Wieland et al., 2012). Establishing the psychometrics of the PIMRA-II will allow researchers to further investigate the topic of comorbid psychopathology in individuals with ID. Furthermore, an important starting point in the development of the dual diagnosis field (e.g., people with ID and co-morbid psychopathology) is identifying a nosology of symptoms by disorder through standardized tests.

Previous researchers have found that psychiatric disorders are often missed in individuals with ID and psychometrically sound instruments are needed for this population (Wieland et al.,

2012). Due to some individuals with ID having poor verbal abilities, psychometrically robust rating instruments to screen for psychopathology tailored to those with ID is essential (Havercamp & Reiss, 1997). The PIMRA-II will allow researchers to investigate the comorbidity of two or more Axis I disorders in individuals with ID, something that is currently needed in the literature (Kozlowski et al., 2011).

Method

Participants

Participants included 307 adults ages 18 - 92 (*M* = 42.68, *SD* = 16.30) assessed at residential treatment centers for individuals with developmental disabilities and group homes in the southeast region of the United States. There were 169 males (55%) and 138 females (45%) in the sample. The ethnic breakdown was 66.1% Caucasian, 31.3% African American, 2.3% Hispanic, and 0.3% of other ethnicity. Of the sample, 178 individuals resided in residential treatment centers for individuals with developmental disabilities (58%) and 129 individuals resided in group homes (42%). Data was collected from developmental disability centers and group homes in the southeast region of the United States.

Archival psychological reports and records were used to determine the IQs of the individuals based on Axis II diagnosis of ID. All participants' records indicated being assessed for their IQ by doctoral psychological staff, or master's level staff under the supervision of the doctoral level psychologist. The participants' records indicated being assessed for ID via cognitive measures such as the *Wechsler Adult Intelligence Scale,* the *Stanford-Binet,* and the *Kaufman Brief Intelligence Test* and adaptive measures such as the *Vineland Adaptive Behavior Scales*, the *Adaptive Behavior Assessment System,* and the *Scales of Independent Behavior*. Using these records, there were 210 individuals with mild ID (68.4%) and 97 individuals with moderate ID (31.6%).

Measures

PIMRA-II. The PIMRA-II is a revised informant-report measure to assess for psychopathology in individuals with mild and moderate ID comprising of 88 items. As the PIMRA was based on the DSM-III criteria, a goal of the PIMRA-II was to revise items from the

PIMRA to reflect the DSM-5 criteria. Other goals of the PIMRA-II were to cover more types of psychopathology, make items easier for informants to understand, and include more examples in the items. Scale items of the PIMRA-II were revised through a series of steps suggested by Crocker and Algina (1986) and Devellis (1991). The pool of items for the revised PIMRA-II were developed following a consideration of items on the PIMRA, review of diagnostic guidelines (i.e., DSM-5 and ICD-10), as well as items on other assessment measures of psychopathology in individuals with ID including the ADD and DASH-II.

The PIMRA-II contains the 56 items that were on the original PIMRA plus 32 new items covering broad range of psychopathologies. Five items related to ASD were added: "becomes upset with small changes in one's routine," "over- or under-reactivity to pain, loud sounds, or light," "Difficulties in using and interpreting nonverbal communication (e.g., problems with eye contact, gestures, and facial expressions)," "restricted or repetitive behaviors or interests (e.g., body rocking, hand flapping, preoccupation with parts of objects," and "difficulties in developing and maintaining friendships appropriate to developmental level." Seven items related to ADHD symptoms were added: "racing thoughts and/or easily distracted," "often fails to given close attention to details or makes careless mistakes," "often forgetful in daily activities," "often loses things necessary for tasks or activities," "often fidgets with or taps hands or feet or squirms in seat," "often 'on the go,' acting as if driven by a motor," and "often has difficulty waiting his or her turn." Four items related to mania were also added to the PIMRA-II: "inflated self-esteem," "increased involvement in pleasurable and/or goal-directed activities (e.g., excessive participation in multiple activities, risky sexual behavior)," "decreased need for sleep," and "pressured speech and/or excessive talking."

In addition to the new items above, five items related to anxiety symptoms (i.e., Obsessive Compulsive Disorder, Specific Phobia, Post Traumatic Stress Disorder, Social Phobia, Panic Disorder) were added: "intrusive thoughts causing anxiety and/or repetitive behaviors to reduce distress," "intense fear involving a particular object or situation (e.g., animals, storms, blood, enclosed places, open areas, or social situations)," "recurrent distressing thoughts about a past traumatic experience," "marked fear or anxiety about social situations in which the individual is exposed to possible scrutiny of others," and "experiences recurrent panic attacks." Four items were added related to depressive symptoms: "thoughts of suicide," "depressed mood most of the day, nearly every day, as indicated by either subjective report or observation made by others," "feelings of worthlessness or excessive or inappropriate guilt nearly every day," and "feelings of hopelessness." Three items related to conduct symptoms were also added: "bullies, threatens, or intimidates others or initiates physical fights," "has deliberately stolen or destroyed others' property," and "often lies for personal gain." Additionally, four other items were added related to personality disorders, sexual disorders, pica, and hoarding: "a detachment from or avoidance of interpersonal contact or unstable interpersonal relationships due to extreme fluctuations between idealization and devaluation," "touching and/or rubbing oneself against a non-consenting person for sexual enjoyment," "persistent eating of nonnutritive, nonfood substances," and "persistent difficulty discarding or parting with possession, regardless of their actual value."

The drafted items were then reviewed by a psychologist who had experience with this population for review. This reviewer provided suggestions for minor revisions to the original set of items. Subsequently, the assessment instrument was piloted by administering the items to five

individuals at a developmental disability center in Louisiana. Additional revisions were made to the items (e.g., clarification) as needed.

The PIMRA-II is administered by an interviewer who should possess a master's degree in a health-related discipline (e.g., psychology, social work, or nursing). The informant should be an individual who has known the person in question for at least six months. It is recommended that when administering the PIMRA-II, that administration occur in a quiet room, items should be read slowly by the interviewer to the informant, and that the informant should be reminded to ask for clarification for any terms they do not understand. The informant should respond either "never a problem," "sometimes a problem," or "often a problem" as to whether the item in question applies to the individual. The interviewer will write a "0" on the protocol form for "never a problem," a "1" for "sometimes a problem," and a "2" for "often a problem." In addition to the items, demographic information such as gender, ID level (e.g., mild or moderate), age, and race will also be collected.

Upon completion of the PIMRA-II, the interviewer should score the measures by transferring the responses onto the scoring profile and summing the total number of endorsements for each subscale and combining them to obtain the total score. For purposes of the current study, the PIMRA-II was completed as part of a comprehensive assessment battery. The PIMRA-II was administered by doctoral level graduate students trained in proper administration of the measure. As part of this training, new students are supervised by a senior student familiar with the PIMRA-II.

Assessment of Dual Diagnosis (ADD; Matson & Bamburg, 1998). See Assessment of Psychopathology in ID section (starting on page 27) for a complete description of the ADD

including psychometric properties. The ADD was used as part of the diagnostic battery for the current sample.

Social Performance Survey Schedule (SPSS; Matson, 1983; Matson, Helsel, Bellack, & Senatore, 1983). The SPSS is a 57-item informant-based behavior rating scale for adults with mild and moderate ID adapted from an instrument created by Lowe and Catuela (1978) which was originally developed for psychiatric inpatients. Items are endorsed by an informant on a 5-point Likert scale with "0" indicating "not at all," "1" indicating "a little," "2" indicating "a fair amount," "3" indicating "much," and "4" indicating "very much." The SPSS consists of four total subscales, two of which are socially desirable subscales (i.e. Appropriate Social Skills and Communication Skills) and two of which are socially undesirable subscales (i.e., Inappropriate Assertion and Sociopathic Behavior). The mean of the inter-rater reliability correlations for the positive behavior items was .71 and .69 for the undesirable behavior items (Matson et al., 1983). Additionally, an internal consistency using Cronbach's alpha ($\alpha = .88$) was found for the total scale in a sample of 67 subjects. Regarding validity, Rojahn and colleagues (2011) established convergent validity between the socially undesirable subscales of the SPSS and the ABC (Aman & Singh, 1986) subscales and divergent validity between the socially desirable subscales of the SPSS and the ABC subscales.

Procedure

The PIMRA-II, ADD, and SPSS were administered by doctoral students in a clinical psychology Ph.D. program. Before administering measures, administrators read a written statement to the participant which was approved by the Louisiana State University Institutional Review Board. The written statement provided information to the participant regarding the purpose of the research study, the option to refuse to participate in the study, and the type of questions that will be asked. Additionally, the participants were told that their names would not be used in the study and that if they decided later they no longer wanted to participate in the study, then they would not be included in the project. The participant was allowed to ask the administrator any questions. If the participant willingly agreed to participate in the project, then they signed a consent form. Every effort was made to ensure that the participants were given information about their involvement in the study and their right to refuse participation.

All administrators were given instruction on how to administer measures and supervision was provided. Administrators administered measures (i.e., PIMRA-II, ADD, and SPSS) to informants who had known the individual in question for at least six months. Items were read slowly to the informants and clarification was provided by the administrator as needed. Upon completion of the measures, the instruments were scored by doctoral students who were trained in the scoring of the measures. This study was approved by the Institutional Review Board of Louisiana State University as well as the Louisiana Department of Health and Hospitals.

Data Analyses

Power

An *a priori* power analysis using GPOWER 3.1 (Faul & Erdfelder, 1992) was conducted to determine the sample size required for the reliability and validity analyses. The sample size necessary to detect a medium effect size of $r = 0.3$, with alpha set at a significance level of .05, and power set at .80 for a two-tailed correlation was calculated. Results of the GPOWER 3.1 power analysis indicated that a total sample size of 82 participants is recommended. For inter-rater and test-retest reliability, a subset of the sample (n = 87) will be used. For the exploratory factor analysis, numerous researchers have indicated that a sample size of 300 is considered a "good" sample size for a factor analysis (Comrey, 1973; Tabachnick & Fidell, 2007). Overall, a sample of 307 participants, which was collected for the study, is sufficient for the analyses.

Reliability

Inter-rater reliability. The inter-rater reliability of the PIMRA-II was evaluated by administering the PIMRA-II to two independent staff informants on the same day and shift with a subset of the sample (n = 87). Intraclass correlations (ICCs) were computed for the two independent informants total PIMRA-II scores and scores for each item. The use of ICC was chosen over Pearson product moment correlations in order to control for the potential differences between raters across participants. High ICCs values indicate high agreement between the two raters on their PIMRA-II endorsements for the individual in question. Items with ICCs below .60 were removed from the scale due to poor reliability.

Internal consistency. To further establish reliability of the scale, analyses of internal consistency were calculated with the retained items. Cronbach's alpha coefficients were computed for the PIMRA-II total score and each subscale of the PIMRA-II (derived from the

factor analysis) to provide an indicator of internal consistency of the measure. High internal consistency for each of the subscales support the notion that each set of items represents constructs which account for a significant portion of the variance in their respective scores. Individual items which significantly decrease the internal consistency of the scale were removed if needed.

Test-retest reliability. Stability of scores over time was computed by test-retest on the PIMRA-II at a two-week inter-assessment interval for a subset of the sample. The same informant and interviewer were used for each administration. ICCs were computed for the total PIMRA-II score as well as each subscale of the PIMRA-II. High correlations indicate a stability of ratings over time.

Validity

Convergent validity. To determine convergent validity, Pearson product moment correlation coefficients were calculated between the total score of the PIMRA-II and the total score of the ADD. As both the PIMRA-II and the ADD are assessment tools for psychopathology in individuals with mild and moderate ID, a significantly positive correlation indicates strong convergent validity.

Discriminant validity. To determine the discriminant validity, Pearson product moment correlation coefficients were calculated between the total score of the PIMRA-II and the total score of prosocial behaviors on the SPSS. As the PIMRA-II is a measure of psychopathology and the SPSS is a measure of social skills, the variables should be only moderately correlated, indicating discriminant validity between the scales.

Factor Structure

Exploratory factor analysis. In order to determine the factor structure of the PIMRA-II, an exploratory factor analysis with principal axis factoring was used on the items of the PIMRA-II (after removal of items via reliability testing). Given the likelihood of high correlations among the underlying constructs of the factors, an oblique promax rotation was run (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The optimal factor structure was determined via examination of the scree plot, comprehensibility of the factors, and Kaiser Criterion (Costello & Osborne, 2005). Item correlation coefficients greater than .30 were retained for each factor (Field, 2005).

Results

Reliability

Interrater Reliability. Interrater reliability was calculated with a subset of the total sample (n = 87). Participants ranged in age from 18 - 92 years (*M* = 35.67, *SD* = 17.25). There were 53 males (60.9%) and 34 females (39.1%) in the sample. Ethnic breakdown was 61.9% Caucasian, 36.9% African American, and 1.1% of other ethnicity. Breakdown regarding ID diagnostic group was 70.1% mild ID and 29.9% moderate ID. All of the participants used in this subset of the sample resided in developmental disability centers. This subset of the total sample was also used for the test-retest reliability, convergent validity, and discriminant validity analyses.

The interrater reliability for the PIMRA-II was investigated by comparing the ratings of two raters using intraclass correlations (ICCs). Two raters completed the PIMRA-II on the same day and shift for 87 individuals. Total scale ICC with all items was .88. ICC for each of the 88 items on the PIMRA-II was also calculated. The mean inter-item ICC was .79 (range .25 -.94). Twelve items had ICC less than .60 and were removed from the scale: "person displays verbal and facial affect that is appropriate to the situation (e.g., smiles or laughs at jokes and evidences appropriate concern when someone tells him/her of a misfortune)," "adjust easily to new situations," "person generally conforms well to rules and social situations," "dependent, helpless, constantly seeking reassurance or is vain and demanding," "excessive dependence evident by subordination of one's own needs to those of persons on which he/she depends," "cannot cope with stress," "recent marked deterioration in work performance, physical appearance, and social relations," "considered pleasant to be around," "easily frustrated with failure," "person is unable to handle routine responsibilities that are reasonable given his/her cognitive abilities," "outgoing

person who interacts frequently and appropriately with others," and "shy, timid, and/or bashful." The original 88 items of the PIMRA-II can be seen in Appendix A. ICCs for each item are listed in Table 1.

Internal consistency. Internal consistency was calculated with the entire sample (n = 307). Participants ranged in age from 18 - 92 years (*M* = 42.68, *SD* = 16.30). There were 169 males (55.0%) and 138 females (45.0%) in the sample. Ethnic breakdown was 66.1% Caucasian, 31.3% African American, 2.3% Hispanic and 0.3% of other ethnicity. Breakdown regarding ID diagnostic group was 68.4% mild ID and 31.6% moderate ID. Regarding living arrangements, 58.0% live in a developmental disability center and 42.0% live in a group home. The total sample was used for the internal consistency and exploratory factor analyses.

Internal consistency via Cronbach's alpha was computed (i.e., after removal of items with poor interrater reliability as described above) for the nine subscales of the PIMRA-II (derived from factor analysis described below) as well as the total scale. The following values were found: Depression Subscale (α = .92), ADHD Subscale (α = .91), ASD Subscale (α = .84), Psychosexual Disorders Subscale (α = .93), Somatic Subscale (α = .75), Anxiety Subscale (α = .92), Conduct Subscale (α = .87), Psychosis Subscale (α = .88), Mania Subscale (α = .84), Total PIMRA-II (α = .76). All values fell in the "good" range (or higher) of Cronbach's alpha greater than .70 (Field, 2005). Additionally, all items on the scale were worthy of retention as their removal would not have significantly increased the internal consistency of the scale.

Test-Retest Reliability. Test-retest reliability was investigated by comparing two ratings by the same rater over a two-week inter-assessment interval using ICCs for 87 individuals (see interrater reliability section for specific demographic information about this subset of the sample). The same informant and interviewer were used for each administration. ICCs were

found for each of the nine subscales as well as the total scale. The ICCs for the subscales were the following: Depression = .91, ADHD = .93, ASD = .91, Psychosexual = .90, Somatic = .89, Anxiety = .93, Conduct = .90, Psychosis = .93, and Mania = .92. The test retest reliability for the total scale was ICC = .91. These high correlations indicate stability of ratings over time.

Validity

Convergent validity. Convergent validity was established by comparing Pearson product moment correlations between individuals' total scores on the PIMRA-II and the ADD for 87 individuals (see interrater reliability section for specific demographic information about this subset of the sample). The Pearson product moment correlation between the PIMRA-II total score and the ADD total score (r = .70) indicates a strong relationship. As both the PIMRA-II and the ADD are assessment tools for psychopathology in individuals with mild and moderate ID, this correlation indicates strong convergent validity. Additionally, internal consistency for the ADD as measured by Cronbach's alpha was α = .79.

Discriminant Validity. Discriminant validity was established by comparing individuals' total scores on the PIMRA-II with their prosocial skills score on the SPSS using a Pearson Product moment correlation for 87 individuals (see interrater reliability section for specific demographic information about this subset of the sample). The Pearson product moment correlation between the PIMRA-II total score and the SPSS prosocial skills score (r = -.39) indicates a moderate relationship. As the PIMRA-II is a measure of psychopathology and the SPSS is a measure of social skills, the moderate correlation between these variables indicates discriminant validity between the scales. Internal consistency for the SPSS as measured by Cronbach's alpha was α = .85.

Factor Analysis

Seventy-six items related to psychopathology in individuals with mild and moderate ID were factor analyzed using principal axis factoring with a direct oblimin (oblique) rotation. An oblique rotation was used given the likelihood of high correlations among the underlying constructs of the factors (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .86 ('great' according to Field, 2005). Bartlett's test of sphericity χ^2 (270) = 15617.87, $p < .001$, indicated that the correlations between items were sufficiently large for running the factor analysis. An initial analysis was run to obtain eigenvalues for each factor in the data. Nine factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 54.76% of the variance. The scree plot, shown in Figure 1, portrayed an inflexion that would justify retaining nine factors. Given the adequate sample size and the convergence of the scree plot and Kaiser's criterion on nine factors, this is the number of factors that were retained in the final analysis (Costello & Osborne, 2005). Table 2 shows the factor loadings after rotation.

Factor 1 was labeled Depression due to the high loadings by the following 13 items: "Depressed mood most of the day, nearly every day, as indicated by either subjective report or observation made by others," "Feelings of hopelessness," "Mood swings and moodiness," "Feelings of worthlessness or excessive or inappropriate guilt nearly every day," "Death wishes and/or hypersensitivity that results in the person's crying easily," "Exhibiting symptoms of sadness, loneliness, unhappiness, hopelessness, and/or pessimism," "Recent significant weight gain or loss or recent change in appetite," "Insomnia or restless sleep," "Thoughts of suicide," "Significant decrease in energy or sleep, physically or mentally (e.g., excessive daytime fatigue, concentration problems)," "Withdraw from social contacts and/or disinterest in previously

pleasurable activities," "Cannot relax," and "Social withdrawal evidenced by the person being less outgoing and evidencing less group participation." This factor explained 10.37% of the variance.

Factor 2 was labeled ADHD due to the high loadings by the following 9 items: "Forgetful in daily activities," "Loses things necessary for tasks or activities," "Fails to given close attention to details or makes careless mistakes," 'On the go' acting as if driven by a motor," "Fidgets with or taps hands or feet or squirms in seat," "Has difficulty waiting his or her turn," "Racing thoughts and/or easily distracted," "Difficulty concentrating because thoughts tend to wander," and "Very nervous or jittery." The variance explained by the ADHD factor was 7.72%. Factor 3 was labeled ASD due to high loadings by the following 8 items: "Restricted or repetitive behaviors or interests (e.g., body rocking, hand flapping, preoccupation with parts of objects), "Over- or under-reactivity to pain, loud sounds, or light," "Difficulties in using and interpreting nonverbal communication (e.g., problems with eye contact, gestures, and facial expressions)," "Difficulties in developing and maintaining friendships appropriate to developmental level," "Becomes upset with small changes in one's routine," "A detachment from or avoidance of interpersonal contact or unstable interpersonal relationships due to extreme fluctuations between idealization and devaluation," "Indifference to praise or criticism or to the feelings of others," and "Has 'odd speech' that is digressive, vague, overelaborate, circumstantial, and/or metaphorical." This factor explained 7.22% of the variance.

Factor 4 was labeled Psychosexual Disorders due to high loadings by the following 9 items: "Preoccupation with evidencing behavior of the opposite sex," "Frequently stated desire to be the opposite sex," "Sense of discomfort about one's biological sex (e.g., wishes he/she could be the opposite sex)," "Touching and/or rubbing oneself against a non-consenting person

for sexual enjoyment," "Typically wears clothing of the opposite sex," "Person exhibits discomfort or fear regarding engaging in sexual activities," "Exposes him/herself in public," "Exhibits sexual excitation over inanimate objects," and "Has sexually assaulted or attempted to sexually assault another person," The variance explained by the Psychosexual Disorders factor was 6.78%. Factor 5 was labeled Somatic Disorders due to high loadings by the following 8 items: "Preoccupation with a perceived defect or flaw in physical appearance that is not observable to others," "The person believes that he/she is more frequently ill than others," "Complains of frequent and excessive pain (e.g., head, stomach, or backaches)," "Fear of a debilitating disease such as cancer despite medical reassurance that such a problem is not present," "Physical illness or the pretext of such an illness is frequently used to avoid unpleasant tasks such as work," "Discusses present or past physical complaints to gain favor or attention," "Frequent complaints of dizziness, chest pains, or shortness of breath despite evidence of no physical problem," and "Refrains from the discussion of physical ailments except when appropriate." This factor explained 5.75% of the variance.

Factor 6 was labeled Anxiety due to high loadings by the following 13 items: "Significant decrease in energy or sleep, physically or mentally (e.g., excessive daytime fatigue, concentration problems)," "Frequent complaints of dizziness, chest pains, or shortness of breath despite evidence of no physical problem," "Recurrent distressing thoughts about a past traumatic experience," "Marked fear or anxiety about social situations in which the individual is exposed to possible scrutiny by others," "Intense fear involving a particular object or situation (e.g., animals, storms, blood, enclosed places, open areas, or social situations)," "Constant fear or worry," "Intrusive thoughts causing anxiety and/or repetitive behaviors to reduce distress (e.g., handwashing, ordering)," "Self-consciousness and a proclivity toward being easily

embarrassed," "Anxious, fearful, tense, or generally worrisome," "Very nervous or jittery," "Experiences recurrent panic attacks," "Cannot relax," and "Withdraw from social contacts and/or disinterest in previously pleasurable activities." The variance explained by the Anxiety factor was 4.96%. Factor 7 was labeled Conduct Disorders due to high loadings by the following 9 items: "Has sexually assaulted or attempted to sexually assault another person," "The person is antisocial in his/her social interactions with others," "Person vandalizes or steals the property of others," "Has deliberately stolen or destroyed others' property," "Bullies, threatens, or intimidates others or initiates physical fights," "Often lies for person gain," "Hostility and/or aggression towards others," "Person is noncompliant and refuses to conform to rules," and "Indifference to praise or criticism or to the feelings of others." This factor explained 4.66% of the variance.

Factor 8 was labeled Psychosis due to high loadings by the following 9 items: "Shows a preoccupation with suspicions that others are trying to take advantage of him/her," "Has "odd speech" that is digressive, vague, overelaborate, circumstantial, and/or metaphorical," "Speech is incoherent (i.e., inability to put words together in a logical sequence) and/or thoughts are distorted," "Marked peculiar behavior, such as wearing a heavy jacket on a hot day, rigid body posture, and/or decreased reactivity to the environment)," "Blunted, flat, or inappropriate affect (e.g., laughing about the death of a friend)," "Cold, unemotional, or lacking a sense of humor," "Hallucinations (auditory, visual, olfactory, gustatory, or tactile)," "Delusions (e.g., bizarre, persecutory, referential, somatic, religious, or grandiose)," and "Social withdrawal evidenced by the person being less outgoing and evidencing less group participation." The variance explained by the Anxiety factor was 3.85%. Factor 9 was labeled Mania due to high loadings by the following 7 items: "Insomnia or restless sleep," "Cannot relax," "Increased involvement in

pleasurable and/or goal-directed activities (e.g., excessive participation in multiple activities, risky sexual behavior)," "Inflated self-esteem," "Has a grandiose sense of self-importance, self-dramatizes, and exaggerates expression of emotions," "Decreased need for sleep," and "Pressured speech and/or excessive talking." This factor explained 3.46% of the variance.

Discussion

The purpose of this study was to examine the preliminary psychometric properties of a psychopathology measure for adults with mild and moderate intellectual disabilities, the PIMRA-II. Interrater reliability for each item ranged from .25 -.94, with the majority of items having a coefficient larger than .70, indicating good to excellent interrater reliability. The interrater reliability for the scale as a whole was excellent, with a coefficient of .88. Twelve items were removed after this analysis given poor interrater reliability coefficients of less than .60.

Internal consistency of the PIMRA-II as measured by Cronbach's alpha was .76. The internal consistency of the nine subscales of the PIMRA-II (as derived by factor analysis) ranged from α = .84-.93. All values exceed the "acceptable" range of Cronbach's alpha greater than .70 (Field, 2005). Additionally, all items on the scale were worthy of retention as their removal would not have significantly increased the internal consistency of the scale. Test-retest reliability was investigated by comparing two ratings by the same rater over a two-week inter-assessment interval using ICC. ICCs for the nine subscales ranged from .89 - .93, with the test retest reliability for the total scale .91. These correlations indicate stability of ratings over time.

Regarding convergent validity, the PIMRA-II showed a strong positive correlation (ICC = .70) with the ADD total score as predicted. This finding was expected given that the ADD and PIMRA-II both measure psychopathology symptoms in individuals with mild and moderate ID. The ADD has been researched over the years and has been found to have strong psychometric properties (Matson & Bamburg, 1998; Matson et al., 1983; Rojahn et al., 2011). Therefore, strong convergent validity with the ADD demonstrates the potential of the PIMRA-II as a valid measure of psychopathology in individuals with mild and moderate ID.

To examine divergent validity, the PIMRA-II was correlated with the prosocial subscale scores on the SPSS. As hypothesized, the PIMRA-II total scores moderately correlated with the prosocial scores on the SPSS at -.39. This finding is not too surprising as previous researchers have found that people with ID generally possess deficits across a broad spectrum of social functioning (Kearney & Healy, 2011; Siperstein, 1992). One theory as to why individuals with ID experience social skills deficits include that the individual's academic and intellectual problems result in rejection or isolation from peers and poor self-concept, which act as an obstacle to the development of social skills (Osman, 1987). Another theory argues that individuals with ID fail to develop or show social skills due to a limited environmental opportunity to learn, perform, or be reinforced for these skills (Gresham, 1988). Regardless, individuals with ID have comorbid deficits that are broad in nature and impact socialization, communication, and daily living skills. Worth noting, however, is that the correlation between the PIMRA-II and the ADD was stronger than the correlation between the PIMRA-II and the prosocial scores of the SPSS. That is, while symptom severity as measured by the PIMRA-II is moderately related to poorer social skills, it is much more strongly related to another established measure of psychopathology in ID, the ADD.

Items in the PIMRA-II were factor analyzed using principal axis factoring with a direct oblimin (oblique) rotation. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .86 ('great' according to Field, 2005). Bartlett's test of sphericity χ^2 (270) = 15617.87, $p < .001$, indicated that the correlations between items were sufficiently large for running the factor analysis. An initial analysis was run to obtain eigenvalues for each factor in the data. Nine factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 54.76% of the variance. The scree plot showed an inflexion that would justify retaining nine

factors. Given the adequate sample size, and the convergence of the scree plot and Kaiser's criterion on nine factors, this is the number of factors that were retained in the final analysis (Costello & Osborne, 2005). The nine factors that were retained are as follows: Depression (13 items), ADHD (9 items), ASD (8 items), Psychosexual (9 items), Somatic (8 items), Anxiety (13 items), Conduct (9 items), Psychosis (9 items), and Mania (7 items).

As previously described, while there are some instruments available for the measure of psychopathology in a mild and moderate ID population, these have their limitations. Measures such as the CBCL, DBC, and NCBRF have strong psychometric qualities, but are only applicable to children with ID. Meanwhile, the DASH-II has robust psychometric properties, but can only be used on individuals with severe and profound ID. Instruments such as the DBC-P, and P-AID are encouraging but still need further research to establish their psychometric properties. Lastly, the ADD, RSMB, PAS-ADD Checklist have strong psychometric properties, but do not have the breath of psychological disorders that the PIMRA-II provides. The PIMRA-II has an ADHD and Mania subscale not found on the ADD, a Conduct, Mania, Anxiety, and Somatic subscale not found on the RSMB, and a Mania Anxiety, Somatic, Conduct, ASD, and Psychosexual subscale not found on the PAS-ADD Checklist. These reasons make the PIMRA-II an important instrument for the measurement of psychopathology in individuals with mild and moderate ID.

Of the previously mentioned scales for of psychopathology for adults with mild and moderate ID, the ADD, RSMB, PAS-ADD Checklist appears to have the strongest psychometric properties and are most similar to the PIMRA-II. All of them are brief measures requiring little formal training to conduct. For a new measure to be truly useful, it must not only perform as well as currently established measures (i.e., ADD, RSMB, PAS-ADD Checklist), but also

surpass them in areas were these measure might be lacking. While the PIMRA-II currently appears to be on par with the ADD, RSMB, and PAS-ADD Checklist regarding initial reliability and validity, future research may provide support for the use of the PIMRA-II in areas not addressed by the ADD, RSMB, and PAS-ADD Checklist including cut-off scores and correspondence with the DSM-V criteria. The preliminary psychometric properties presented in the current study make the case for continued research with the PIMRA-II to investigate its potential use in areas where other measures are lacking.

This study improves the quality of the PIMRA, making it a screening tool that can be used with a greater variety of psychopathology. While subscales for psychosis, affective disorders, psychosexual disorders, anxiety, and somatic disorders are found on the original PIMRA, the PIMRA-II introduces new subscales such as ASD, Mania, Conduct Problems, and ADHD. Additionally, items concerning pica and hoarding have been added to the PIMRA-II. The PIMRA-II has comparable psychometric properties to the original PIMRA and an extended variety of items making it an improved measure for the screening of psychopathology in individuals with mild and moderate ID.

The current study supports the reliability and validity of the PIMRA-II as a new and revised measure for psychopathology in adults with mild and moderate ID. The study has many strengths including a large sample size and data from both in-patient developmental disability centers and group homes. However, there are limitations to consider and address in future research. Due to the nature of the sample used, data for the interrater reliability, test retest reliability, and validity tests were used solely from in-patient developmental disability centers. It would be hypothesized that similar results would be reached by using data from a group home population; however, future research should investigate to determine if the results would be

replicated. Given that this is a preliminary study regarding the psychometric properties of the PIMRA-II, the current findings certainly support continued data collection and research to further evaluate the use of this measure.

Using larger sample sizes to replicate the reliability and validity found in the current study would be essential for future research. In addition, a larger sample size would allow for the establishment of cut-off scores for clinically significant and at-risk ranges for each subscale. It would also be interesting to further investigate using the PIMRA-II with individuals under 18 years of age. A larger, more diverse sample of individuals under 18 years of age would better establish the psychometric properties for the PIMRA-II for this younger age group. Few measures have been developed to address psychopathology in children and adolescents with ID and this addition would further differentiate the PIMRA-II from existing measures of psychopathology in ID populations.

Lastly, future research should examine the validity of establishing a self-report version of the PIMRA-II, in which the individual could report their own symptoms of psychopathology. Emotional and behavioral characteristics of individuals with ID have traditionally been assessed by proxy reports that are completed by informants (e.g., parents or caregivers) because it has been assumed that individuals with ID do not have the capacity to self-report on these domains (Haynes, Gilmore, Shochet, Campbell, & Roberts, 2012; Shevell, 2008). Intellectual impairment is frequently associated with difficulties in communication (Shevell, 2008), working memory (Lifshitz, Shtein, Weiss, & Vakil, 2011), and self-insight (Jahoda, Wilson, Stalker, & Cairney, 2010), all of which are necessary to respond accurately to questionnaires about inner emotional or behavioral states. Despite the extensive use of informant based report measures for individuals with ID, a notable limitation is that someone else is reporting on the internal states of

the person with ID. As internal states may not always be evident behaviorally, informant reporting can be arduous and potentially unreliable, and there may be a low agreement between self and other reports (Heiman, 2006). Recent researchers have suggested, however, that many individuals with ID do have the capacity to response to self-report questionnaires (Douma, Dekker, Verhulst, & Koot, 2006; Emerson, Robertson, & Wood, 2005) and that modifications such as pictorial representations and limited forced choice options can strengthen their validity (Hartley & MacLean, 2006).

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Appendix

The interrater reliability for the PIMRA-II comparing the ratings of two raters using intraclass correlations (ICCs)

Item	ICC	Item	ICC	Item	ICC	Item	ICC
1	.50	23	.73*	45	.90*	67	.89*
2	.57	24	.78*	46	.85*	68	.86*
3	.86*	25	.84*	47	.92*	69	.93*
4	.72*	26	.78*	48	.82*	70	.92*
5	.81*	27	.81*	49	.46	71	.85*
6	.84*	28	.86*	50	.89*	72	.89*
7	.89*	29	.90*	51	.72*	73	.86*
8	.91*	30	.93*	52	.82*	74	.83*
9	.41	31	.37	53	.43	75	.84*
10	.79*	32	.87*	54	.86*	76	.93*
11	.76*	33	.84*	55	.87*	77	.90*
12	.87*	34	.87*	56	.89*	78	.91*
13	.59	35	.93*	57	.92*	79	.86*
14	.74*	36	.31	58	.94*	80	.85*
15	.72*	37	.25	59	.86*	81	.90*
16	.89*	38	.89*	60	.91*	82	.84*
17	.85*	39	.87*	61	.90*	83	.84*
18	.53	40	.92*	62	.84*	84	.92*
19	.49	41	.52	63	.81*	85	.83*
20	.86*	42	.72*	64	.91*	86	.86*
21	.75*	43	.86*	65	.86*	87	.90*
22	.74*	44	.81*	66	.92*	88	.87*

Note. *$p < .05$

Factor loadings and communalities based on a principal axis factoring with oblique rotation for the Psychopathology Inventory for Mentally Retarded Adults-II (PIMRA-II) (N = 307)

Item	Factor								
	1	2	3	4	5	6	7	8	9
Depressed mood most of the day, nearly every day, as indicated by either subjective report or observation made by others.	.853								
Mood swings and moodiness.	.852								
Feelings of hopelessness.	.850								
Feelings of worthlessness or excessive or inappropriate guilt nearly every day.	.849								
Death wishes and/or hypersensitivity that results in the person's crying easily.	.838								
Exhibiting symptoms of sadness, loneliness, unhappiness, hopelessness, and/or pessimism.	.821								
Recent significant weight gain or loss or recent change in appetite.	.775								
Thoughts of suicide.	.677								
Insomnia or restless sleep.	.666								.401

Item	Factor								
	1	2	3	4	5	6	7	8	9
Significant decrease in energy or sleep, physically or mentally (e.g., excessive daytime fatigue, concentration problems).	.585								
Withdraw from social contacts and/or disinterest in previously pleasurable activities.	.404					.335			
Forgetful in daily activities.		.886							
Loses things necessary for tasks and activities.		.880							
Fails to give close attention to details or makes careless mistakes.		.860							
Fidgets with or taps hands or feet or squirms in seat.		.855							
“On the go” acting as if driven by a motor		.854							
Has difficulty waiting his or her turn.		.810							
Racing thoughts and/or easily distracted		.682							
Difficulty concentrating because thoughts tend to wander.		.602							
Over- or under-reactivity to pain, loud sounds, or light.			.814						
Restricted or repetitive behaviors or interests (e.g., body rocking, hand flapping, preoccupation with parts of objects).			.803						

Item	Factor								
	1	2	3	4	5	6	7	8	9
Difficulties in using and interpreting nonverbal communication (e.g., problems with eye contact, gestures, and facial expressions).			.800						
Difficulties in developing and maintaining friendships appropriate to developmental level.			.788						
Becomes upset with small changes in one's routine.			.734						
A detachment from or avoidance of interpersonal contact or unstable interpersonal relationships due to extreme fluctuations between idealization and devaluation.			.500						
Preoccupation with evidencing behavior of the opposite sex.				.903					
Frequently stated desire to be the opposite sex.				.886					
Sense of discomfort about one's biological sex (e.g., wishes he/she could be the opposite sex).				.859					
Touching and/or rubbing oneself against a non-consenting person for sexual enjoyment.				.827					
Typically wears clothing of the opposite sex.				.804					
Person exhibits discomfort or fear regarding engaging in sexual activities.				.772					
Exposes him/herself in public.				.761					

Item	Factor								
	1	2	3	4	5	6	7	8	9
Exhibits sexual excitation over inanimate objects.				.761					
Has sexually assaulted or attempted to sexually assault another person.				.612			.353		
Preoccupation with a perceived defect or flaw in physical appearance that is not observable to others.					.840				
The person believes that he/she is more frequently ill than others.					.833				
Fear of a debilitating disease such as cancer despite medical reassurance that such a problem is not present.					.784				
Physical illness or the pretext of such an illness is frequently used to avoid unpleasant tasks such as work.					.781				
Complains of frequent and excessive pain (e.g., head, stomach, or backaches).					.748				
Discusses present or past physical complaints to gain favor or attention.					.715				
Frequent complaints of dizziness, chest pains, or shortness of breath despite evidence of no physical problem.					.490	.406			
Refrains from the discussion of physical ailments except when appropriate.					.418				
Recurrent distressing thoughts about a past traumatic experience.						.791			

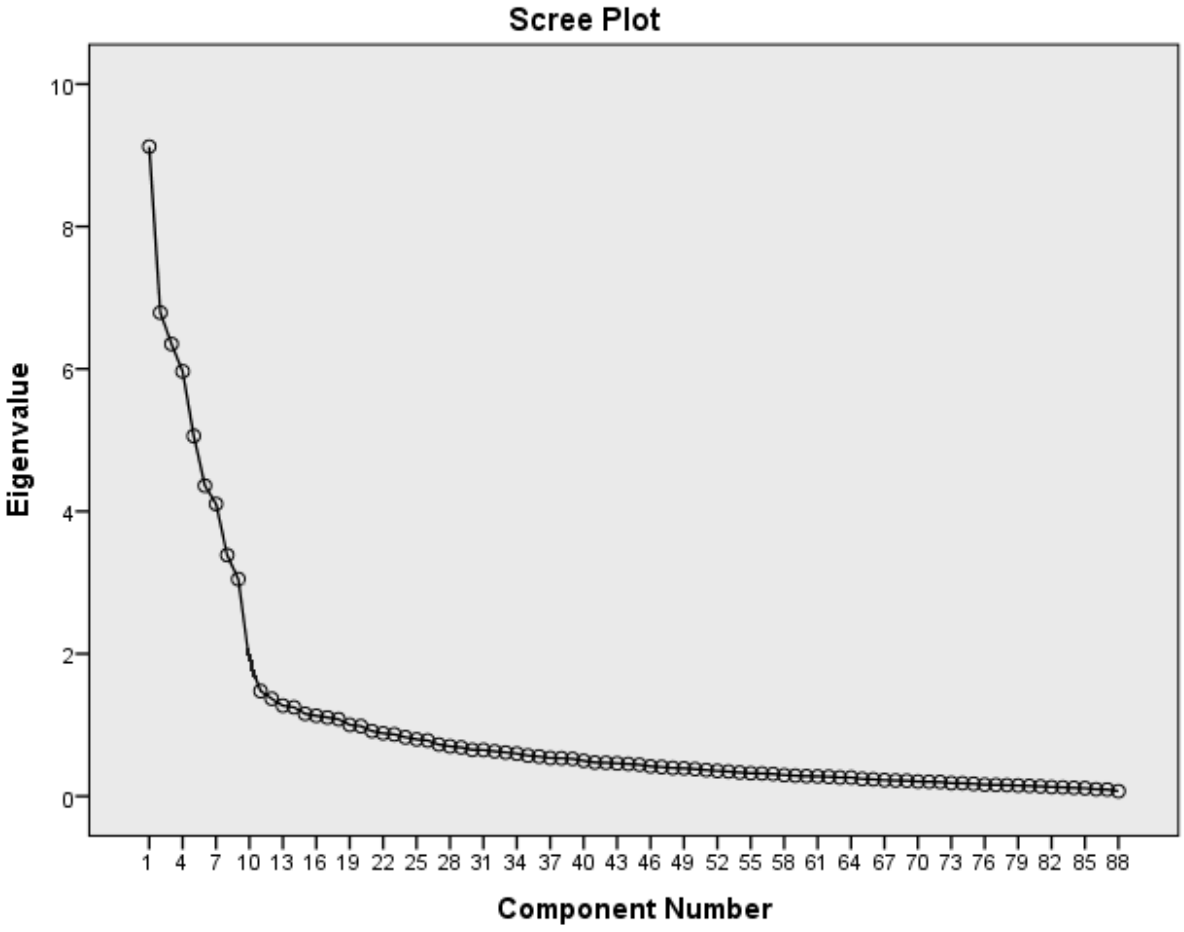
Item	Factor								
	1	2	3	4	5	6	7	8	9
Marked fear or anxiety about social situations in which the individual is exposed to possible scrutiny by others.						.788			
Intense fear involving a particular object or situation (e.g., animals, storms, blood, enclosed places, open areas, or social situations).						.862			
Constant fear or worry.						.857			
Intrusive thoughts causing anxiety and/or repetitive behaviors to reduce distress (e.g., handwashing, ordering).						.818			
Self-consciousness and a proclivity toward being easily embarrassed.						.808			
Anxious, fearful, tense, or generally worrisome.						.791			
Very nervous or jittery.		.328				.730			
Experiences recurrent panic attacks.						.619			
Cannot relax.	.310					.433			.334
Has deliberately stolen or destroyed others' property.							.791		
Bullies, threatens, or intimidates others or initiates physical fights.							.788		
Person vandalizes or steals the property of others.							.776		

Item	Factor								
	1	2	3	4	5	6	7	8	9
The person is antisocial in his/her interactions with others.							.773		
Often lies for personal gain.							.752		
Hostility and/or aggression towards others.							.699		
Person is noncompliant and refuses to conform to rules.							.649		
Indifference to praise or criticism or to the feelings of others.			.503				.561		
Shows a preoccupation with suspicions that others are trying to take advantage of him/her.								.797	
Blunted, flat, or inappropriate affect (e.g., laughing about the death of a friend).								.767	
Speech is incoherent (i.e., inability to put words together in a logical sequence) and/or thoughts are distorted.								.762	
Marked peculiar behavior, such as wearing a heavy jacket on a hot day, rigid body posture, and/or decreased reactivity to the environment).								.744	
Cold, unemotional, or lacking a sense of humor.								.738	
Has “odd speech” that is digressive, vague, overelaborate, circumstantial, and/or metaphorical.			.401					.716	

Item	Factor								
	1	2	3	4	5	6	7	8	9
Delusions (e.g., bizarre, persecutory, referential, somatic, religious, or grandiose).								.669	
Hallucinations (auditory, visual, olfactory, gustatory, or tactile).								.658	
Social withdrawal evidenced by the person being less outgoing and evidencing less group participation.	.317							.338	
Has a grandiose sense of self-importance, self-dramatizes, and exaggerates expression of emotions.									.842
Inflated self-esteem.									.839
Increased involvement in pleasurable and/or goal-directed activities (e.g., excessive participation in multiple activities, risky sexual behavior).									.837
Decreased need for sleep.									.802
Pressured speech and/or excessive talking.									.720

Note. Factor loadings < .3 are suppressed. Two items failed to load highly on any factor but are still included in the total score.

Scree Plot for Factor Analysis



Items on the PIMRA-II

Depression Subscale

- Depressed mood most of the day, nearly every day, as indicated by either subjective report or observation made by others
- Feelings of hopelessness
- Mood swings and moodiness
- Feelings of worthlessness or excessive or inappropriate guilt nearly every day
- Death wishes and/or hypersensitivity that results in the person's crying easily
- Exhibiting symptoms of sadness, loneliness, unhappiness, hopelessness, and/or pessimism
- Recent significant weight gain or loss or recent change in appetite
- Insomnia or restless sleep
    - This item cross loads with both Depression and Mania Subscale.
- Thoughts of suicide
- Significant decrease in energy or sleep, physically or mentally (e.g., excessive daytime fatigue, concentration problems
- Withdraw from social contacts and/or disinterest in previously pleasurable activities
    - This item cross loads with both Depression and Anxiety Subscale.
- Cannot relax
    - This item cross loads with both Depression, Anxiety, and Mania Subscale.
- Social withdrawal evidenced by the person being less outgoing and evidencing less group participation
    - This item cross loads with both Depression and Psychosis Subscale.

ADHD Subscale

- Forgetful in daily activities
- Loses things necessary for tasks or activities
- Fails to given close attention to details or makes careless mistakes
- "On the go" acting as if driven by a motor
- Fidgets with or taps hands or feet or squirms in seat
- Has difficulty waiting his or her turn
- Racing thoughts and/or easily distracted
- Difficulty concentrating because thoughts tend to wander
- Very nervous or jittery
    - This item cross loads with both ADHD and Anxiety Subscale.

ASD Subscale

- Restricted or repetitive behaviors or interests (e.g., body rocking, hand flapping, preoccupation with parts of objects
- Over- or under-reactivity to pain, loud sounds, or light
- Difficulties in using and interpreting nonverbal communication (e.g., problems with eye contact, gestures, and facial expressions
- Difficulties in developing and maintaining friendships appropriate to developmental level
- Becomes upset with small changes in one's routine

- A detachment from or avoidance of interpersonal contact or unstable interpersonal relationships due to extreme fluctuations between idealization and devaluation
- Indifference to praise or criticism or to the feelings of others
    - This item cross loads with both ASD and Conduct Subscale.
- Has 'odd speech' that is digressive, vague, overelaborate, circumstantial, and/or metaphorical
    - This item cross loads with both ASD and Psychosis Subscale.

Psychosexual Disorders

- Preoccupation with evidencing behavior of the opposite sex
- Frequently stated desire to be the opposite sex
- Sense of discomfort about one's biological sex (e.g., wishes he/she could be the opposite sex)
- Touching and/or rubbing oneself against a non-consenting person for sexual enjoyment
- Typically wears clothing of the opposite sex
- Person exhibits discomfort or fear regarding engaging in sexual activities
- Exposes him/herself in public
- Exhibits sexual excitation over inanimate objects
- Has sexually assaulted or attempted to sexually assault another person
    - This item cross loads with both Psychosexual and Conduct Subscale.

Somatic Disorders

- Preoccupation with a perceived defect or flaw in physical appearance that is not observable to others
- The person believes that he/she is more frequently ill than others
- Complains of frequent and excessive pain (e.g., head, stomach, or backaches)
- Fear of a debilitating disease such as cancer despite medical reassurance that such a problem is not present
- Physical illness or the pretext of such an illness is frequently used to avoid unpleasant tasks such as work
- Discusses present or past physical complaints to gain favor or attention
- Frequent complaints of dizziness, chest pains, or shortness of breath despite evidence of no physical problem
    - This item cross loads with both Somatic and Anxiety Subscale.
- Refrains from the discussion of physical ailments except when appropriate

Anxiety Disorders

- Significant decrease in energy or sleep, physically or mentally (e.g., excessive daytime fatigue, concentration problems)
- Frequent complaints of dizziness, chest pains, or shortness of breath despite evidence of no physical problem
    - This item cross loads with both Somatic and Anxiety Subscale.
- Recurrent distressing thoughts about a past traumatic experience
- Marked fear or anxiety about social situations in which the individual is exposed to possible scrutiny by others

- Intense fear involving a particular object or situation (e.g., animals, storms, blood, enclosed places, open areas or social situations)
- Constant fear or worry
- Intrusive thoughts causing anxiety and/or repetitive behaviors to reduce distress (e.g., handwashing, and ordering)
- Self-consciousness and a proclivity toward being easily embarrassed
- Anxious, fearful, tense, or generally worrisome
- Very nervous or jittery
    - This item cross loads with both ADHD and Anxiety Subscale.
- Experiences recurrent panic attacks
- Cannot relax
    - This item cross loads with both Depression, Anxiety, and Mania Subscale.
- Withdraw from social contacts and/or disinterest in previously pleasurable activities
    - This item cross loads with both Depression and Anxiety Subscale.

Conduct Disorders

- Has sexually assaulted or attempted to sexually assault another person
    - This item cross loads with both Psychosexual and Conduct Subscale.
- The person is antisocial in his/her social interactions with others
- Person vandalizes or steals the property of others
- Has deliberately stolen or destroyed others' property
- Bullies, threatens, or intimidates others or initiates physical fights
- Often lies for personal gain
- Hostility and/or aggression towards others
- Person is noncompliant and refuses to conform to rules
- Indifference to praise or criticism or to the feelings of others
    - This item cross loads with both ASD and Conduct Subscale.

Psychosis

- Shows a preoccupation with suspicions that others are trying to take advantage of him/her
- Has "odd speech" that is digressive, vague, overelaborate, circumstantial, and/or metaphorical
    - This item cross loads with both ASD and Psychosis Subscale.
- Speech is incoherent (i.e., inability to put words together in a logical sequence) and/or thoughts are distorted
- Marked peculiar behavior, such as wearing a heavy jacket on a hot day, rigid body posture, and/or decreased reactivity to the environment
- Blunted, flat, or inappropriate affect (e.g., laughing about the death of a friend)
- Cold, unemotional, or lacking a sense of humor
- Hallucinations (auditory, visual, olfactory, gustatory, or tactile)
- Delusions (e.g., bizarre, persecutory, referential, somatic, religious, or grandiose)

- Social withdrawal evidenced by the person being less outgoing and evidencing less group participation
    - This item cross loads with both Depression and Psychosis Subscale.

Mania

- Insomnia or restless sleep
    - This item cross loads with both Depression and Mania Subscale.
- Cannot relax
    - This item cross loads with both Depression, Anxiety, and Mania Subscale.
- Increased involvement in pleasurable and/or goal-directed activities (e.g., excessive participation in multiple activities, risky sexual behavior)
- Inflated self-esteem
- Has a grandiose sense of self-importance, self-dramatizes, and exaggerates expression of emotions
- Decreased need for sleep
- Pressured speech and/or excessive talking

Other Items on PIMRA-II

- Persistent eating of nonnutritive substances
- Persistent difficulty discarding or parting with possession, regardless of their actual value

Items Removed Due to Poor Reliability

- Person displays verbal and facial affect that is appropriate to the situation (e.g., smiles or laughs at jokes and evidences appropriate concern when someone tells him/her of a misfortune)
- Adjust easily to new situations
- Person generally conforms well to rules and social situations
- Dependent, helpless, constantly seeking reassurance or is vain and demanding
- Excessive dependence evident by subordination of one's own needs to those of persons on which he/she depends
- Cannot cope with stress
- Recent marked deterioration in work performance, physical appearance, and social relations
- Considered pleasant to be around
- Easily frustrated with failure
- Person is unable to handle routine responsibilities that are reasonable given his/her cognitive abilities
- Outgoing person who interacts frequently and appropriately with others
- Shy, timid, and/or bashful

Copy of Institutional Review Board Approval Form

Project Report and Continuation Application

(Complete and return to IRB, 131 David Boyd Hall.
Direct questions to IRB Chairman Robert Mathews 578-8692.)

Institutional Review Board
Dr. Robert Mathews, Chair
131 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu | lsu.edu/irb

IRB#: 3288 **Your Current Approval Expires On:** 6/25/2013

Review type: Expedited **Risk Factor:** Minimal **Date Sent: 4/9/2013**

PI: Johnny Matson **Dept:** Psychology **Phone:** Aug-45

Student/Co-Investigator:

Project Title: Norming and Development of Measures for Treatment and Diagnosis of Individuals with Intellectual and Developmental Disabilities

Number of Subjects Authorized: 500

Please read the entire application. Missing information will delay approval!

I. PROJECT FUNDED BY: LSU proposal #:

II. PROJECT STATUS: Check the appropriate blank(s); and complete the following:

_X__ 1. **Active**, subject **enrollment continuing**; # subjects enrolled: _94__
___ 2. **Active**, subject **enrollment complete**; # subjects enrolled: ____
___ 3. **Active**, subject **enrollment complete**; work with subjects continues.
___ 4. **Active, work with subjects complete**; data analysis in progress.
___ 5. Project **start postponed**
___ 6. **Project complete;** end date __/__/__
___ 7. **Project cancelled**: no human subjects used.

III. PROTOCOL: (Check one).

_X_ Protocol continues as previously approved
___ Changes are requested*
- *List (on separate sheet) any changes to approved protocol.*

IV. UNEXPECTED PROBLEMS: (did anything occur that increased risks to participants):

➢ State number of events since study inception:_0_ since last report:_0_
➢ If such events occurred, describe them and how they affect risks in your study, in an attached report.
➢ Have there been any **previously unreported** events? Y/N _N ?
(if YES, attach report describing event and any corrective action).

V. CONSENT FORM AND RISK/BENEFIT RATIO:

Does new knowledge or adverse events change the risk/benefit ratio? Y/N_N_;
Is a corresponding change in the consent form needed? Y/N_N/A

VI. ATTACH A BRIEF, FACTUAL SUMMARY of project progress/results to show continued participation of subjects is justified; or to provide a final report on project findings.

VII. ATTACH CURRENT CONSENT FORM (only if subject enrollment is continuing); and check the appropriate blank:

___ 1. Form is unchanged since last approved
_X_ 2. Approval of revision requested herewith: (identify changes) **modified to emphasize that no negative consequences will result from declining participation**

Signature of Principal Investigator: [signature] **Date:** 4-9-2013

IRB Action: √ Continuation approved; **Approval Expires:** 4/10/14
___ Disapproved
___ File closed

Signed [signature] Date 4/11/13

Form date: April 16, 2008

Vita

Brian Christopher Belva, a native of Hopkinsville, Kentucky, received his bachelor's degree at Georgetown College in 2007. Thereafter, he completed his master's degree in Clinical Psychology at Murray State University in 2009. As his interests in psychology grew, especially in the area of intellectual disabilities and autism spectrum disorders, he decided to enter the Clinical Psychology Ph.D. program at Louisiana State University. He completed his predoctoral internship at the University of Tennessee Health Science Center in Memphis, Tennessee. He will receive his Ph.D. in Clinical Psychology in December 2014 and plans to complete a postdoctoral fellowship at the Marcus Autism Center through Children's Health of Atlanta in Atlanta, Georgia.